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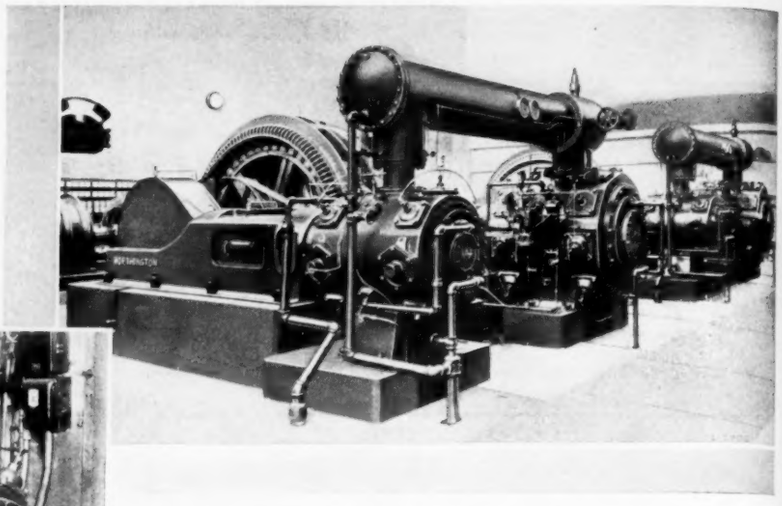

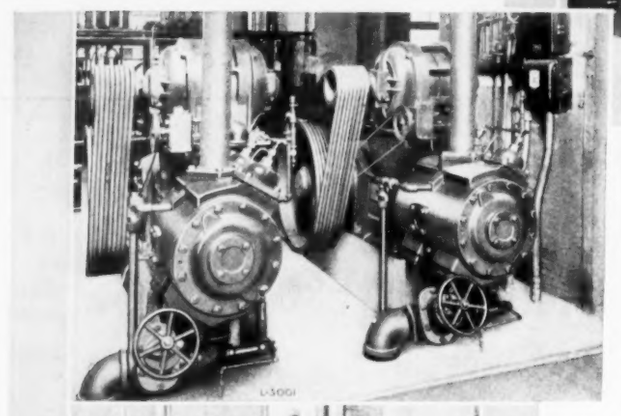

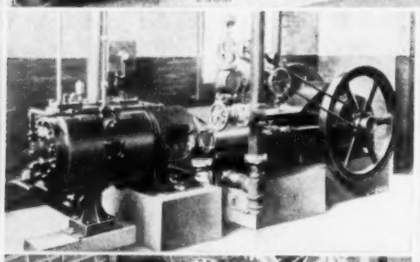

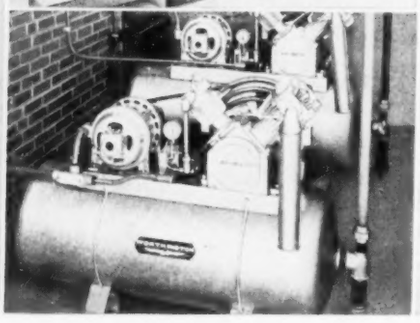

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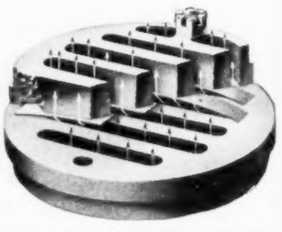

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As the Editor Views the News

IN SPEAKING to the members of the National Press club last Wednesday, Joseph P. Kennedy, chairman of the securities and exchange commission (SEC) presented a reassuring statement of that commission's attitude toward business. He said:

> "Everybody says that what business needs is confidence. I agree. Confidence that if business does the right thing it will be protected and given a chance to live, make profits and grow, helping itself and helping the country. But the old things business did—the old practices it followed—are, some of them, no longer the right ones.
>
> "But not all the old practices are wrong, and there is no belief, at least none in the minds of SEC, that business is to be viewed with suspicion; that it must be harassed and annoyed and pushed around. . . ."

• • •

A Good Text for New Deal

This would make an admirable policy for President Roosevelt to apply to all activities of the new deal. In one simple sentence—"*If business does the right thing, it will be protected and given a chance to live, make profits and grow, helping itself and helping the country.*"—he has a text which should be impressed indelibly upon the mind of every administrator, bureau chief or other executive of the federal government. If the President would remove from his administration the element of vindictiveness and replace it with fair play for deserving businesses, confidence would be restored quickly.

• • •

Will Mistake Be Rectified?

No reasonable person could criticize the "cracking down" on finance, business and industry if it were directed principally toward guilty individuals or companies. But the bulldozing by the new deal has been indiscriminate. It has fallen upon innocent and guilty alike. Apparently the government saw more political advantage in damning "Wall street," "big business," or the "money changers" than in acting specifically against known culprits. It was inevitable that under this sort of treatment, the management of financial, commercial and industrial companies would move cautiously. At any rate, confidence has been so thoroughly routed by the persistent muckraking that the President and his advisers now may be on the verge of realizing the extent of their mistake. The Kennedy statement, coupled with other recent utterances, may be construed as signs that the administration has discovered belatedly that it needs the good will of business.

• • •

Triple Threat for Iron Ore

That industry must be constantly on the alert to the implications of sectional, as well as national, political developments is well illustrated by the situation now confronting the Lake Superior iron ore operators. In the most important statement on iron ore problems issued in many years, R. C. Allen, president, Lake Superior Iron Ore association, points out (p. 19) the dangers threatened by the proposal of the Farmer-Labor party in Minnesota to confiscate the mines, the discriminatory tax laws of that state and the possibility of the free passage of ore-carrying ocean freighters from the Atlantic to the Lakes through the proposed St. Lawrence waterway. This timely article deserves the attention of every producer and user of iron and steel.

• • •

Profits Cheer Industry

Business sentiment is stimulated by the sharply improved earnings reports for the second quarter (p. 10), which show what industry can do when a fair volume of tonnage is offered. Encouraging also is the strong tone in automobiles, refrigerators and air conditioning equipment. Detroit is speculating upon the likelihood of a large body company introducing all-steel bodies with steel tops for 1935 models. Should this materialize (p. 17), consumption of flat rolled steel by one corporation would be increased about 35,000 tons annually. World consumption of tin for tin plate, as reported (p. 31) for the year ending May, 1934, shows this product to be one of the best "depression" commodities.

E. L. Shaner

Millions for Mills, None for Ingot Capacity, Under Code

THIRTY million dollars for new steel finishing capacity, principally sheet and strip mills, and nothing for new blast furnaces, open-hearth furnaces or bessemer converters, except to complete remodeling or repair projects!

This is the record of the steel industry in the past 11 months, operating under that provision of the steel code which prohibits the construction of new pig iron or steelmaking capacity, but imposes no restrictions on finishing capacity.

Further, before the end of 1934 it is possible that this expenditure for new mills will be practically doubled. Two continuous sheet-strip mills to cost $12,000,000 each are under consideration.

In the accompanying compilation of mills completed since the code was signed last Aug. 19, mills now under construction and new projects under consideration, 27 installations are listed.

Three for Standard Products

Twenty-four of these 27 are for the production of flat rolled steel and only three are for other standard products (see STEEL, July 23, p. 22). Flat rolled capacity thus embraces all but 115,000 tons of the 4,955,300 tons of capacity of these projects.

Sixteen mills have been completed since last Aug. 19, many of them authorized or actually begun before the code was adopted. These 16 represent an outlay of approximately $4,000,000 and have a combined annual capacity of 1,401,300 tons.

Eight mills now are being built, at a cost of approximately $25,900,000. They will have a combined annual capacity for producing 1,754,000 tons of finished steel. All of these are for rolling strip, except one seamless tube mill of 30,000 tons capacity.

The largest of these are the four-high 79-inch hot strip mill recently contracted for by the Ford Motor Co., for erection at Dearborn, Mich., and also a four-high 79-inch hot strip mill for the Youngstown Sheet & Tube Co., at its Campbell (Youngstown) plant. Each of these mills will have an annual capacity for 600,000 tons of hot strip, and will also have facilities for cold rolling. Since a continuous mill of this type costs $6,000,000, and double that figure when cold finishing capacity is included, these two mills alone will represent an outlay of $24,000,000.

The United States Steel Corp. last week authorized construction of a 200,000-ton, 4-high, 42-inch hot strip mill, with cold finishing capacity, for the McDonald, O., works of the Carnegie Steel Co. The National Steel Corp. has a large continuous mill under consideration for its Great Lakes Steel division at Detroit; and so has Bethlehem Steel Co. for Sparrows Pt., Md., or Lackawanna (Buffalo), N. Y. These two mills will have annual capacity for 1,200,000 tons of hot strip.

By comparison with the 27 mills installed, now being built or under serious consideration since last Aug. 19, a total of 20 finishing mills was completed in 1933, 45 in 1932, 33 in 1931, 94 in 1930, and 97 in 1929.

New Finished Steel Capacity Since Code Was Signed

	TYPE	ESTIMATED ANNUAL CAPACITY
MILLS INSTALLED:		
Eastern Rolling Mill Co., Baltimore	4-high 84-inch cold strip	200,000
Jones & Laughlin Steel Corp. South Side Works, Pittsburgh	4-inch Steckel cold sheet	100,000
Reeves Mfg. Co., Dover, O.	28-inch sheet	7,500
United States Steel & Wire Co., Newark, N. J.	8 and 12-inch cold strip	7,000
Thomas Steel Co., Warren, O.	24-inch Steckel cold strip	20,000
Canton Tin Plate Corp., Canton, O.	Hot tin	4,400
Follansbee Bros. Co., Follansbee, W. Va.	38-inch Steckel cold finishing	100,000
Follansbee Bros. Co., Follansbee, W. Va.	40-inch hot tin	4,400
Inland Steel Co., Indiana Harbor, Ind.	4-high 42-inch cold strip	125,000
Inland Steel Co., Indiana Harbor, Ind.	38-inch Steckel cold strip	100,000
Universal Steel Co., Bridgeville, Pa.	24-inch Steckel cold strip	20,000
American Sheet & Tin Plate Co., Gary, Ind.	Two 84-inch hot strip	600,000
American Sheet & Tin Plate Co., Gary, Ind.	3-high sheet	14,000
American Sheet & Tin Plate Co., Vandergrift, Pa.	3-high sheet	14,000
Bethlehem Steel Co., Sparrows Point, Md.	8-inch bar	50,000
Globe Steel Tubes Co., Milwaukee.	Seamless tube	35,000
	Total	1,401,300
MILLS NOW BEING BUILT		
Rotary Electric Co. (Michigan), Detroit	20-inch cold strip	24,000
McClouth Steel Corp., Detroit	20-inch Steckel hot strip	120,000
Youngstown Sheet & Tube Co., Youngstown, O.	4-high 79-inch hot strip	600,000
Youngstown Sheet & Tube Co., Indiana Harbor, Ind.	42-inch Steckel hot strip	240,000
Greer Steel Co., Dover, O.	4-high 30-inch cold strip	40,000
Ford Motor Co., Dearborn, Mich.	4-high 79-inch hot strip	600,000
Standard Tin Plate Co., Canonsburg, Pa.	38-inch Steckel cold strip	100,000
Pittsburgh Steel Products Co., Allenport, Pa	Seamless tube	30,000
	Total	1,754,000
MILLS AUTHORIZED:		
Carnegie Steel Co., McDonald, O.	4-high 42-inch hot strip	200,000
MILLS UNDER CONSIDERATION:		
National Steel Corp., Great Lakes division, Detroit	4-high 79-inch hot strip	600,000
Bethlehem Steel Co., Sparrows Point, Md., Lackawanna, N. Y.	4-high 79-inch hot strip	600,000
	Total	1,400,000
	GRAND TOTAL	4,555,300

Financial

FIRST returns on iron and steel company earnings for the second quarter show the industry once more on a profit basis.

Four important independents—Bethlehem, Jones & Laughlin, Sheet & Tube and Wheeling—earned a total of $6,474,611 in the June quarter, compared with an aggregate loss of $4,308,269 in the March quarter. These four represent about one quarter of the ingot capacity of the country.

Profits also are forecast for the United States Steel Corp., which will report Tuesday, and for Republic, National, Inland

and other large interests. The Republic report, incidentally, appears to be a little delayed because of negotiations for acquiring the Corrigan, McKinney Steel Co.

BETHLEHEM TO PAY ON PREFERRED

Bethlehem Steel Corp.'s showing of a net profit of $3,441,642 in the second quarter was sufficiently strong to warrant directors in declaring the regular quarterly dividend of $1.75, payable Oct. 1 to record of Sept. 7. No action, however, was taken on the accumulated dividend of $12.25 a share.

This net of $3,441,642 in the second quarter, after all charges, compares with a deficit of $902,044 in the first quarter, and a loss of $3,312,846 in the second quarter of 1933.

Relating the improved position to preferred stock, the second quarter profit was $3.69 per share, and averaged over the first half year it was $2.72 per share. Concerning a continuation of the preferrel dividend, Bethlehem officials maintained any future payments were subject to the operating situation, which averaged 51.8 per cent in the second quarter compared with 38.7 per cent in the first quarter.

At present, Bethlehem is operating at 25 per cent, and E. G. Grace, president, appraised the third quarter average as 25 to 30 per cent. In regard to the near outlook for business, Mr. Grace could see little if any gain in general business confidence, an opinion that appeared to meet response in Charles M. Schwab, chairman, who, commenting on the recent sharp break in the stock market, said he regarded it as reflecting public sentiment.

SHEET & TUBE NET $1,012,207

Youngstown Sheet & Tube Co., Youngstown, O., profited to the extent of $1,012,207 after all charges in the second quarter, compared with a loss of $1,423,468 in the first quarter, and a deficit of $2,207,592 in the second quarter of 1933. Gross income of $3,866,259 in the second quarter was more than double the $1,721,138 of the first quarter. This is the first profit reported by the company since the fourth quarter of 1930. Ratio of current assets to liabilities as of June 30 was 10.68 to 1.

¶Wheeling Steel Corp., Wheeling, W. Va., reports net profit of $1,134,511 in the second quarter after all charges, against net loss of $58,233 in the first quarter, and profit of $482,143 in the second quarter a year ago. For the six months ended June 30, Wheeling's net was $1,076,178, compared with a deficit of $320,276 in the first half of 1933.

¶Sharon Steel Hoop Co., Sharon, Pa., shows a net profit of $436,671 after all charges in the first half, contrasted with a net loss of $257,426 in the first half of 1933. The first half profit was equal to $1.22 a share on capital stock outstanding, excluding shares in the treasury and in the hands of trustees.

Bethlehem Earns Over $3,000,000 April-June

	Second Quarter 1934	First Quarter 1934	Second Quarter 1933
Total income of the corporation and its subsidiary companies	$8,738,463	$4,025,956	$1,669,559
Less—Interest charges	1,714,938	1,672,730	1,662,550
Balance	$7,023,525	$2,353,226	$ 7,009
Less—Provision for depletion and depreciation	3,581,642	3,255,270	3,319,855
Net income for the period	$3,441,642	*$ 902,044	*$3,312,846

*Deficit.

J. & L. PROFIT IS $886,252.

Jones & Laughlin Steel Corp., Pittsburgh, went into the black to the extent of $886,252 in the second quarter after all charges, contrasted with a net loss of $1,924,524 in the first quarter, and a deficit of $1,682,801 in the second quarter of 1933. The showing for the first half of 1934 is a deficit of $1,038,272 total earnings in the second quarter prior to interest on bonds, and reserves for depreciation and depletion were $2,391,508. The preferred dividend was passed.

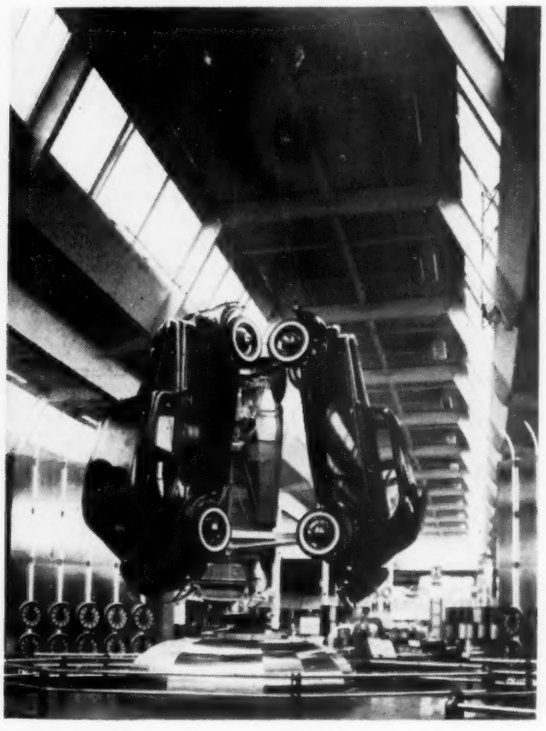
¶Superior Steel Corp., Pittsburgh, loss in the second quarter was $5676, a sharp reduction from the the deficit of $74,771 in the corresponding quarter of 1933. The first half showing is a deficit of $11,942, against a loss of $247,108 in the like period of 1933.

¶Wickwire Spencer Steel Co., New York, reports net income, after charges, of $15,479, against net loss of $83,452 in the first quarter and loss of $91,081 in the second quarter of 1933.

¶Virginia Iron, Coal & Coke Co., Roanoke, Va., reports net loss of $46,377 after charges in the second quarter. First half loss was $46,426, against $36,570 in first half of 1933.

¶Pittsburgh Screw & Bolt Corp., Pittsburgh, ran up a net profit of $328,870 in the first half, against a net loss of $293,987 in the first half of 1933.

¶Allis-Chalmers Mfg. Co., Milwau-



STEEL IS STRONG: Ford Motor Co. proves it graphically at the Century of Progress in Chicago. Each Ford is suspended by two wire ropes from one spoke in the steel wheel attached to the ceiling. But this is no strain, for this wheel could hold the weight of 11 more Fords, and not show it

kee, reports a second quarter loss of $145,100, compared with a deficit of $677,153 in the first quarter, and $788,920 in the June quarter.

¶General Refractories Co., Philadelphia, had net profit of $255,752 after charges in the second quarter, against $144,723 in the first quarter and $58,026 in the June quarter last year. Net for the first half of 1934 is $400,475; for the year ended June 30 it was $637,620.

¶Truscon Steel Co., Youngstown, O., second quarter profit was $26,494, compared with a deficit of $146,100 in the first quarter and $143,601 in the second quarter of last year.

¶Union Carbide & Carbon Corp., New York, reports net income of $4,779,506 in the second quarter, a slight gain over the $4,337,939 in the first quarter and $2,642,744 in the second quarter of 1933.

¶STEEL, in its issue of July 16, page 14, stated that the declaration of a common stock dividend by the Allegheny Steel Co. was "the first common dividend by any producer of steel since the depth of the depression, with the exception of National Steel Corp. which has not missed a dividend since its organization."

Granite City Steel Co., Granite City, Ill., points to its unbroken record of a dividend on its common stock from June, 1929, to and including June, 1934, the rate varying from $1 to 25 cents quarterly.

Laclede Steel Co., St. Louis, is another producer with an unsullied record, its present payment being at the rate of 60 cents a share yearly. STEEL is sorry for these inadvertent omissions. Are there any other producers with so good a record?

¶Excepting only the West Indies and Germany, foreign investors in the United States Steel Corp. common stock increased during the second quarter, these holdings aggregating 376,288 shares or 4.32 per cent of the total outstanding. On June 30 holdings in Holland totaled 133,676 shares; England, 135,190; Canada, 58,440; France, 14,673; the West Indies, 5303; Switzerland, 3836; Belgium, 2822; Scotland, 3195; Austria, 2326 and Germany, 1256.

U. S. Steel Corp.

CONSOLIDATION of the department of industrial relations and that of safety, sanitation and welfare of the United States Steel Corp. has just been announced by President W. A. Irvin, effective July 1.

The new consolidation will be known as industrial relations department and will be in charge of Arthur H. Young, vice president.

Harry A. Schultz has been appointed assistant to the vice president and will continue the administration of matters heretofore under his direction.

Andrew R. Mathieson has been appointed assistant to vice president to assist Mr. Young in industrial relations.

¶Carnegie Steel Co., a Steel corporation subsidiary, will proceed shortly to add a 42-inch strip mill capable of rolling strip and sheets up to 36 inches wide and to No. 18 gage at its McDonald mill near Youngstown, O.

¶Another Corporation subsidiary—the Illinois Steel Co.—will shortly start improvements to its 28-inch mill at Gary.

NRA

DONALD R. RICHBERG, formerly chief counsel for NRA and K. M. Simpson, of International Chromium Process Co., and formerly an NRA division administrator, have been formally reappointed administration members of the steel code authority. Since the adoption of the steel code last Aug. 17, they have represented the administration at meetings of the institute.

CODES APPROVED

For air filter, sprocket chain and gas-powered industrial truck manufacturing industries, supplemental to MAPI code, effective Aug. 1.

For gas forging manufacturing industry, effective July 29, providing open price lists, authorizing development of a uniform cost accounting system, and forbidding wilfully destructive price cutting.

CODE AUTHORITIES APPROVED

Authority for metal coating code: T. M. Gregory, Hanlon-Gregory Co., Pittsburgh; A. J. Blaeser, Joslyn Manufacturing & Supply Co., Chicago; E. K. Cooley, San Francisco Galvanizing Co., San Francisco; G. H. Koven, L. O. Koven Bro., Jersey City, N. J.; F. P. Auxer, National Telephone & Supply Co., Cleveland; C. S. Whitney, Dover Stamping & Mfg. Co., Cambridge, Mass., and J. P. Cattie, Jos. P. Cattie Bros., Philadelphia.

Complaints board for gear manufacturing industry: F. H. Fowler, chairman, Chicago; H. H. Kerr, North Quincy, Mass.; Howard Dingle, Cleveland; R. C. Ball, Philadelphia; Richard Ferguson, Gastonia, N. C.; F. B. Drake, Berkeley, Calif., and Cutter P. Davis, Springville, N. Y.

NEW POLICY ON AVERAGE HOURS

NRA has modified the practice of averaging maximum work hours over periods of weeks or months, the new basis being as follows:

To the extent that it is impracticable to provide an inflexible maximum hours limitation in view of peculiar seasonal or other needs of an industry, a stated maximum with a proviso for a definite tolerance (on a weekly or daily basis) may be provided. To penalize abuse, the payment of overtime for hours worked in excess of the stated maximum but within the tolerance, should be required. Where a definite tolerance is not sufficient, particular defined circumstances (such as emergency maintenance and repair) may justify unlimited tolerance, with payment of overtime for all time in excess of the maximum.

¶Provision also is made for code authorities to formulate and keep current a classification of all types of customers of those industries where this is necessary for enforcement of code provisions. This is expected to simplify the function of individual manufacturers. Presumably, this does not apply to steel.

¶It is announced that "NRA policy favors 'cost or market whichever is lower' as the normal basis for valuation of materials wherever they ap-

GLAD THEIR COMPANY IS 80 YEARS OLD AND GOING STRONG: Part of the crowd of nearly 800 employes of Lil Co group celebrated by a second picnic July 21 when employes of the p

pear in the cost formulas which have been provided in approved codes." This policy has been adopted instead of either "market" or "cost" to avoid the evils of provisions which require artificial mandatory profits to those who have accumulated inventories at low prices and to avoid the necessity of shifting the formula for cost from time to time to the basis which is at the moment most favorable to industry, in view of current market conditions.

¶Amendments to the scrap iron code proposed by the scrap iron code authority do not concern labor or trade practice provisions of the industry by giving the code authority certain necessary legal powers for correcting omissions and defects in the master code for the waste material trade.

HEAR GRAY IRON CODE

¶Deputy administrator Cowling will hold a hearing, Aug. 7, at the Willard hotel, Washington, on request by certain southern foundries in Arkansas and Tennessee for the adoption of the 28c minimum hourly wage rate for common labor, the same as paid in other southern states. Also, on the application of the Holmes Foundry Co., Port Huron, Mich., for exemption from all provisions of the gray iron foundry code.

¶Public hearing on the code of fair competition for the metal hospital furniture manufacturing industry will be conducted by acting deputy administrator White, Aug. 4, Room 2062, Department of Commerce building, Washington.

Basing Point

M. L. MEADORS, of the New Orleans office of the federal trade commission, is in Birmingham, Ala., investigating the complaint of the Southern Association of Steel Buyers and Consumers that the $3 a ton differential at Birmingham over Pittsburgh, on steel shapes, sheet and wire products, is handicapping the South. W. C. Martin, head of the Vulcan Rivet & Bolt Corp., Birmingham, is president of the association.

Canada

EFFECTIVE Aug. 1, Canadian custom officials, directed by the department of national revenue, will accept the valuation of steel products fixed by NRA codes as the market values for duty purposes. The bulletin follows:

For the present, and until otherwise ordered, iron and steel products covered by the code of fair competition for the iron and steel industry under the national recovery act may be allowed entry for regular duty purposes on the value under the code at the basing point for the product established under the code nearest to delivery point in Canada, although shipped from other points.

The value for special or dumping duty purposes at the place of shipment will be upon the basis of the price at the said nearest basing point for the product, plus all rail freight to destination in Canada, less the freight from shipping point to destination.

Structural Code

BATTLING to retain in the construction industry code the steel erection provisions which originally were in the structural steel fabricators code, organized labor last week was attempting to gather evidence to prove that the American Institute of Steel Construction, New York, does not represent the fabricating industry.

Telegrams dispatched to various independent fabricators by P. J. Morrin, president of the International Association of Bridge, Structural and Ornamental Iron Workers, were viewed in this light. The fact is, representatives of more than 300 fabricators recently addressed messages to Clyde G. Conley, president of the institute, urging inclusion of erection in the fabricators' code, and more than 80 per cent of the industry supported the code.

Following the vigorous protest lodged by fabricators against the emasculated code, which was to be effective July 22, NRA last week stayed the effective date 15 days to Aug. 16. Conferences between NRA officials and the institute continue.

Placing erection under the construction code would give control of this branch of the industry to purchasers, the institute contends. It is viewed as another effort of labor to obtain control of the industry.

¶New Jersey officials are aroused by the ultimatum of NRA that its state codes, including the one for the structural steel industry, must conform to the corresponding NRA codes. Conferences are being held to iron out the difficulties.

Production

STEELMAKING operations eased a half point last week to 29½ per cent when only Youngstown and Buffalo mills increased and eastern Pennsylvania, Pittsburgh, Cleveland-Lorain and New England recorded decreases. This week Birmingham production will decline sharply, and scheduled decreases in the New England and Chicago districts will probably lower the rate further.

Youngstown — Up 4 points last week to 35 per cent. District mills will start this week at this rate. Buying continues light but prospects are brightening for better operations in the last half of August, mill manufacturers believe.

Eastern seaboard district—Down 2½ points to 22 to 23 per cent, with reductions in steelmaking operations at three plants. One mill, by closing two open hearths, has temporarily suspended operations entirely. Whether this week will show any improvement is questionable.

Cleveland-Lorain—Down 3 points to 33 per cent, with Otis Steel Co. operating four open hearths, Corrigan, McKinney Steel Co. three, and National Tube Co., Lorain, six. While schedules for this week have not been fully determined, steelmakers do not expect an improvement.

New England — Expected gains failed to materialize last week and the ingot rate went off 4 points to 48 per cent. Steelworks schedules for the week starting July 30 indicate a decline to 43 per cent, lowest in this territory in more than two years.

Chicago—Steelmaking operations

of Lel Co., Dunkirk, N. Y., plant gathered July 14 to celebrate eightieth anniversary of the company's founding. A similar the plervliet, N. Y., were entertained, as related in STEEL, *July 23, page 48*

were maintained last week at an average of 34 per cent, thus holding the 3 point gain of the preceding period. This rate may be reduced slightly this week but little deviation is anticipated over the next few weeks. Blast furnace operations are holding, with 9 of 36 steelworks stacks on the active list.

Buffalo—Increased 8 points last week to 29 per cent and expected to hold there. Steelmakers anticipate no return to the high production of May and June until after Labor Day.

Birmingham, Ala.—Unchanged last week at 20 per cent, but with all of the open hearth furnaces at the Fairfield works of the Tennessee Coal, Iron & Railroad Co. being taken off this week, steelmaking operations here will be virtually at a standstill.

Detroit—Unchanged at 76 per cent one producer having all nine open hearth on and another four out of eight.

Wheeling—Unchanged at about 27 per cent, with nine open hearth furnaces active.

Pittsburgh—Off 1 point to 20 per cent. An important maker is holding at a little under 25 per cent, but this is averaged down by most independents.

¶Shipments of steel sheets by independent mills increased from a daily average of 7765 net tons in May to 10,061 tons in June, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Sales, however, dropped from 7945 tons daily to 3828, and production fell from 8275 to 6648. Totals for June: Shipments, 301,832 tons; sales, 114,855 tons; production, 199,438 tons. Total sheet capacity in the country for June was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

¶Census of manufactures report for abrasive wheels, stones, paper, cloth and related products for 1933: Number of establishments 74; average wage earners 4880; wages paid $4,976,243; cost of materials and fuel $11,300,135; total value of products $30,032,522; value added by manufacture $18,732,337.

Foreign Trade

JUNE exports of iron and steel products from the United States totaled 219,406 gross tons, compared with 241,753 tons in May, and 192,581 tons in June, 1933.

For six months, exports aggregated 1,253,174 tons against only 517,750 tons in the first half of 1933, according to the iron and steel division, bureau of foreign and domestic commerce, Washington.

Labor

FOLLOWING conferences July 24 and 25 with representatives of the Republic Steel Corp. and the Amalgamated Association of Iron, Steel and Tin Workers, the national steel labor industrial relations board announced July 26 that an accord had been reached. Republic, it will be recalled, recently severed its relations with the Amalgamated because of the growing radicalism of its leadership.

The accord reached last week is understood to affect certain departments of Republic's Warren and Niles, O., and Moline, Ill., plants. It does not necessarily imply that Republic will renew its contract, though it has always been willing to pay the scale and meet with its men.

Chairman Stacy refused to explain the basis of settlement on the ground that "details are yet to be worked out, although all parties are in unity on the principles."

He said the board regards the settlement as satisfactory. Incidentally the board entered this dispute on its own initiative, and this is the first case to be settled by it.

Representatives of Republic at the conference included R. J. Wysor, W. P. Belden, K. F. Veach, J. S. Voss and C. H. Elliott, and of the Amalgamated, Charles Ogburn of New York and Edward W. Miller of Pittsburgh.

¶A settlement made at Chicago, Wednesday, between the Amalgamated and the Western Bar Iron association, makes the new wage scale hinge on the outcome of the next 60-day settlement to be reached Aug. 20. If the August bar iron average, based upon mill sales develops a base other than the present 1.90c base, then whatever that differential is it will be added to every subsequent settlement.

BETHLEHEM TO SPREAD WORK

Employes of the Bethlehem Steel Corp. are assured by E. G. Grace, president, in the current issue of Bethlehem Review that despite the present decline in steel business "every employe may be assured that our policy will be to give our employes as much work as we can, sharing it among as many as possible and thus keeping intact the forces which will be needed when business improves."

The principles under which Bethlehem will operate are that long-service men, men with families, and the most responsible and efficient workers will receive first consideration. Secondly, some of the newer men will be placed on the waiting list, not terminated, to be given work as soon as it is available.

The objectives of Bethlehem's industrial relations program are (1) every possible effort to be made to provide steady work, (2) good wages to be maintained, (3) good supervision to be provided, (4) good working conditions to prevail, (5) the time of retirement to be anticipated and (6) close contact between employes and management to be maintained by the employes representation plan.

¶Business advisory and planning council of the department of commerce, set up by Secretary Roper to do long-range planning, has sent a questionnaire to all code authorities calculated to develop basic information and sentiment on unemployment insurance.

MUST EMPLOY HANDICAPPED

A special commission, appointed by NRA Administrator Johnson to study the effect of codes upon employment of the physically and mentally handicapped, has reported that employers must be induced to hire a greater proportion of these persons or the great bulk will have to be pensioned and kept in idleness at public expense.

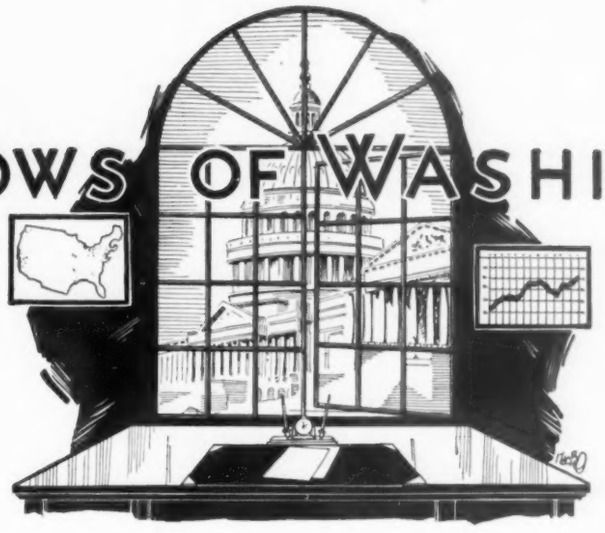
¶National Industrial Conference board, New York, reports that its second survey on collective bargaining, based on returns from 2681 companies employing 2,093,503 wage earners, discloses that 43.8 per cent of these employes were dealing individually with their employers, compared with 48.9 per cent in November, 1933. Employes under plans of employe representation increased from 43.2 per cent in November to 46.5 per cent in May, while those dealing through organized labor unions increased from 7.9 per cent in November to 9.6 in May.

METAL EMPLOYMENT OFF

Employment at metalworking centers in June declined for the first time in six months, according to the monthly report of the National Metal Trades association. The decrease was slight, however, the June index of 68.3 comparing with 69.5 in May and with 52.4 in June, 1933. June employment was higher than any month of the first quarter, and in excess of October, 1933, the best month of last year. Largest decreases in June employment were shown at Detroit, Grand Rapids, Mich., and the Tri-Cities. Slight gains were recorded in New England, Pittsburgh, Milwaukee and St. Louis.

¶Cost of living of industrial wage earners resumed its upward trend in May when the index of the National Industrial Conference board, based on 1923 equaling 100, rose 0.3 per cent to 78.8. Stated another way, the purchasing value of the dollar, with 1923 as 100 cents, was 126.9 cents in June, compared with 127.2 in May and 137.4 in June, 1933.

WINDOWS OF WASHINGTON



WASHINGTON

IT WILL be exactly one year tomorrow—the 31st—that iron and steel executives trooped into the hot auditorium of the department of commerce building for the public hearing on their NRA code.

Excepting only meetings of the American Iron and Steel institute, there had not been such a gathering of the steel clan since the funeral of Judge Gary in the fall of 1927. Down in front were Taylor, Grace, Girdler, Filbert, Irvin, the Blocks, Dalton, Verity, Purnell, Crawford, Ker, Gillies—and a score more.

Wielding the gavel was K. M. Simpson, of International Chromium, later to become an administration member on the code authority. Closely supporting him was General Johnson, just embarking on his "crack down" career and with the mortality rate on cats still low. Droning out the case for the steel industry was Robert P. Lamont, shortly to be supplanted as institute president.

Captains of industry and labor, representing the respective advisory boards of NRA, were drawn up in a semicircle, labor appropriately at the left. An important figure was Secretary of Labor Perkins, who not only delivered an able address but also was flattered when Taylor sought her out for a quiet chat.

Shirt-sleeved, sprinkled through the audience, was a scattering of radical labor advocates whose applause for their spokesmen belied their numbers.

A scant two blocks away, in the White House, was the President just beginning to shuffle the cards of the new deal and thoroughly enjoying his cloak of infallibility. He was one of the few outside of leaders of the industry and NRA who knew that that the hearing was a setup.

IN MANY ways, that was the high water mark of the recovery program.

Here was steel, greatest of industries, "voluntarily" raising wages 10 per cent and surrendering the merit clause of its code without a fight.

Then, indeed, was all industry spiraling upward from the dark days of March; steel, for example, had expanded 280 per cent in production since March. The rebound in production, and generally also in sentiment, was as pronounced as the blackness in early March was impenetrable.

Industry was coming to Washington and eating out of the administration's hand. The "brain trust" was functioning in every cell. Commodity prices were to be lifted to 1926 levels. The idea of corraling all the gold and beating down the value of the dollar, for the profit of the treasury, was taking form. PWA was off to a flying start. The farm administration was taking over the functions of nature. Congress was abdicating daily in favor of the President. The country was being recast, and 1933 was to be year 1 of the era of security and equality for all.

Barring an era of state socialism—and, incidentally, that is a phrase now being heard more often—it is probable that men now living will never again witness such a concentration of industry and power in the capital.

CONTRAST that picture with today. His neck chafed with leis, the President is in Hawaii, for one thing to win surcease from strike troubles. General Johnson is bouncing about the Southwest in the rumble seat of a coupe. The batting average of the brain trust is no runs, no hits, all errors. The administration is plainly on the defensive.

Steel was indeed at its peak last July, when the steel code was in the making, for in August it began to slide, and even in the recovery of this spring it failed to equal the ingot rate of July. At present, at about 30 per cent, steelmaking operations are just about one half what they were a year ago.

A year ago, there were few who failed to give lip service to NRA and the recovery program, for patriotic reasons if no others. Today, the criticism and discontent with the program is widespread and being uttered in places which a year ago were genuinely enthusiastic.

Even nature has rebelled, and farmers, regarding the destruction and repression of productivity as a sin, are commencing to believe that deity is no longer on the side of the administration.

A new low sentiment was plumbed early in July when the country realized the import of the President's signing the Frazier-Lemke farm mortgage and the railroad pension bills. It was an indication that anything the farmers and labor sought was theirs. Nothing has cost the administration more prestige among business men.

It is recording fact, and not easy criticism, to state that unbiased, trustworthy reports show a rising tide of criticism of the new deal. It also needs to be recorded that despite all the discouragements now offered to business, there is an underlying sentiment that the country will weather the storm.

This confidence is posited primarily on these two points: (1) that the country has a destiny, and (2) no matter how high a dam is built the water will eventually overflow it. It is remarkable how the most violent criticism of the present economic order is followed by pronounced confidence in the recovery of business, a few expecting a good fall, and all banking on a whopper 1935.

PROBABLY no single program of the administration has been so upsetting as the attitude of NRA on prices.

In many codes, including steel, NRA sanctioned some form of price stabilization. When the federal trade

commission and the now-defunct Darrow recovery board started bombarding pricing matters, NRA drew them more closely to its bosom.

Then it was announced that all codes would be stripped of all price provisions. A short time afterward, it was stated that no such thing was contemplated.

Came the President on June 29 with his executive order permitting producers to chisel their code prices as much as 15 per cent to the government and other public agencies. A side remark of his plainly indicated his desire that the public benefit to the same extent.

NRA, dealing only with executive orders and not with side remarks, promptly exempted the coal industry from compliance with the order, and interpreted it to mean that a 15 per cent reduction on ship plates to the navy did not necessarily mean that tank builders could exact a like concession.

But the impression has gone up and down the land that the President means that prices are to go lower. Any large producer of coal can relate the difficulties of selling coal at this time. Consumers of steel who stocked steel, thinking it would rise farther, are holding the bag, and sellers are sincerely embarrassed. The effect of the tangle is to restore a spot market in all commodities.

A YEAR ago the railroads began to feel pretty good about their situation.

Not only was traffic rising but they also were exempted from NRA. There was a measure of freedom in this, also some satisfaction that industry would begin to appreciate how the railroads have long struggled under the regulation of the interstate commerce commission.

But the arm of NRA is long and has finally encircled the carriers. Supplies and materials now cost them $137,000,000 more a year on account of codes and wage increases.

When NRA began raising wages in industry, railroad labor demanded the equivalent, and the President decreed gradual withdrawal of the 10 per cent wage reduction on the railroads. The restoration July 1 will cost the roads $156,000,000 this year.

That pension bill which the President approved late in June, after admitting it was crudely drafted, starts out next year with a drain of $66,000,000 annually at the outset. These three drafts upon the carriers total $359,000,000 a year and are the basis for the present search for more revenue.

An increase in freight rates is one possibility. A meeting of executives in Chicago a week ago developed some sentiment in favor of rises, not to exceed 3 cents per 100 pounds, on commodities shipped 200 miles or more, exempting shorter distances on account of the possibility of diverting more short-haul traffic to motor trucks.

Freight rates, it will be recalled, were put up about one third In 1920 in the proceeding known as Ex Parte 74. In 1922 they were generally reduced 10 per cent, and since then about 15 per cent through individual adjustments. The surcharge granted the railroads beginning Jan. 4, 1932, expired last fall.

It is noteworthy that when stocks took a nose dive last week two classifications were prominent—railroads and metals; the former because of an appreciation of their inincreasing burden, and also injury to traffic by the drought, and the latter because of the belief that any inflation engineered by Washington this year to support business prior to the election will be of a credit and not a currency nature.

AS THE weeks go by, the potentialities in direct loans to industry which RFC is empowered to make diminish.

The average small manufacturer, nearing the end of his resources, cannot meet the specification that the loans be utilized for the purchase of materials and for meeting payrolls. If he had orders requiring materials and labor he could in most cases obtain accommodation at his own bank.

An applicant must give a detailed operation of his experience the past five years, or since 1929. He must report salaries, and RFC reserves the right to pare these to a "reasonable" basis. It will be recalled that when RFC undertook to make loans to railroads it set what amounted to a top of $60,000.

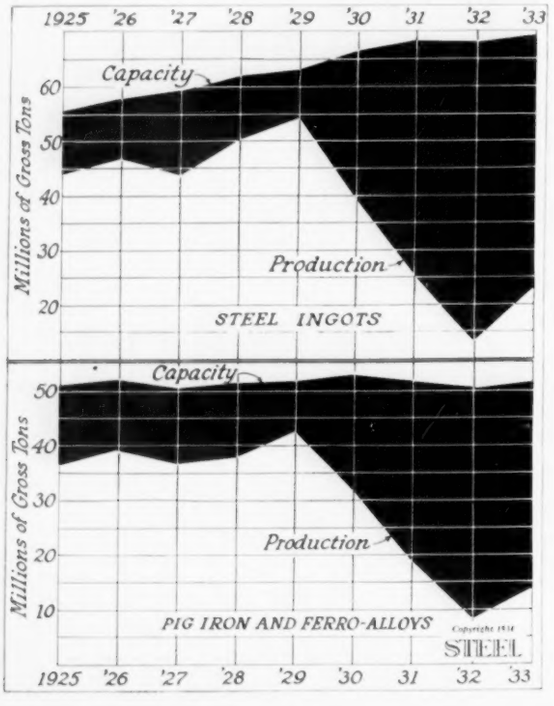
No dividends can be paid on any stock until the loan is repaid. To any one company the maximum that could be loaned is $500,000, which admittedly would not save a United States Steel Corp. or a Henry Ford if either neared the rope's end.

While these loans are not proving a business hypodermic—thus far not a dollar has actually been advanced—RFC gradually is emerging from the cloud of being a Republican-organized institution. Fearing this very thing, former President Hoover manned it with Democrats, but to no avail.

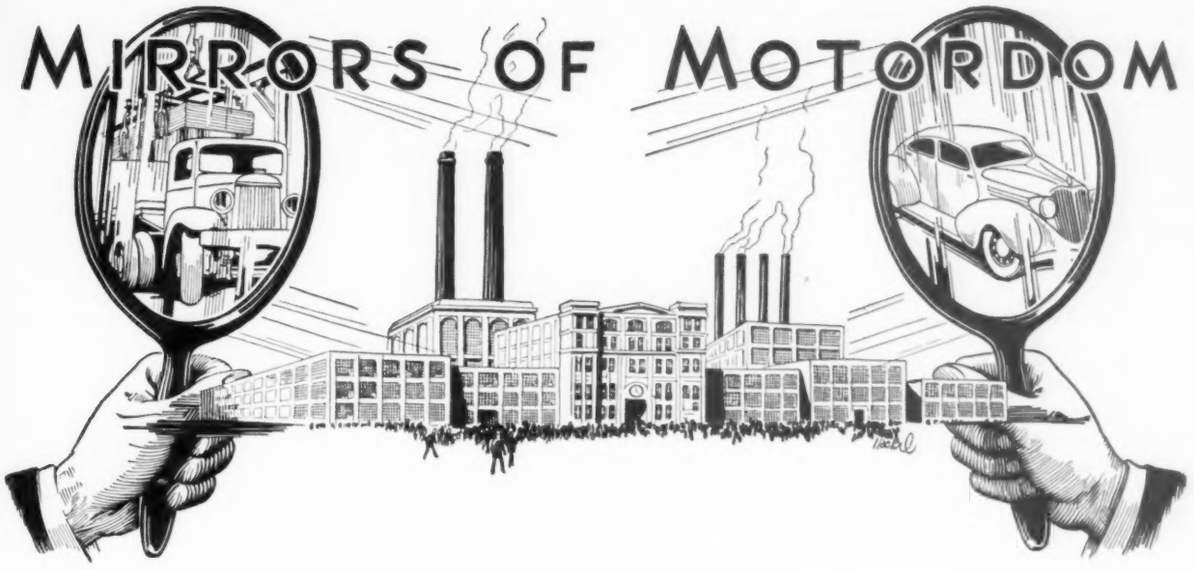
A year ago, when the recovery act creating NRA also appropriated $3,300,000,000 for public works, the desirability of getting this money speedily in circulation through materials and labor prompted many in Washington to urge that the RFC be utilized. It was set up to do the job in a limited way through the public works program inaugurated by Mr. Hoover.

But the politically-minded advisers of the President vetoed this. No organization with a G.O.P. origin should be entrusted to distribute three billion dollars. So PWA was organized under Secretary of the Interior Ickes, and so complete was his divorcement of politics from the job that the complaint now is he used too fine a filter. Some politics, of course, has crept in and will be heard from during this fall's campaign.

A week ago, learning that RFC has some $250,000,000 on ice, Mr. Ickes proposed that it be diverted to him. This was a genuine act of reconciliation, and to some in Washington a bit of poetic justice. It is not likely that RFC will part with any of its money even to Mr. Ickes.



ON THE accompanying chart the areas in black represent the spread between production and consumption of pig iron and steel ingots, or, in other words, unused capacity. Except for an infinitesimal reduction at the close of 1932, *steel capacity has been increasing through the depression. The trend in pig iron capacity was downward in both* 1931 *and* 1932. *Actual capacity for making steel ingots on Dec.* 31, 1933, *was* 69,390,625 *gross tons; for pig iron,* 51,110,061 *tons. Statistics are by the American Iron and Steel institute*



DETROIT

QUALIFIED by the reservation that important changes are sometimes made even after production has been started, it seems safe at this time to predict that body designs for 1935 automobiles will fall into three major classifications.

One is typified by this year's Chrysler and DeSoto; another by the current LaSalle; the third is a composite of Hupp, Hudson-Terraplane and Studebaker.

General Motors is understood to be trending toward LaSalle as its prototype. There will be variations, of course, but the narrow, knife-edge radiator shell probably will be characteristic of all.

The new Pontiac six which is almost ready and is calculated to divert some of the gravy of the low-price field to Buick-Pontiac dealers, will shortly afford an insight to General Motor's thinking.

As nearly as anything in the way of automotive design can be considered permanent, the airflow characteristics of Chrysler and DeSoto are here to stay. Some changes, of course, will be made for 1935. There is considerable speculation that the Chrysler Corp's experience with these redically-streamlined models will be related to the 1935 Dodges and Plymouths.

The third group may be expected to subordinate treatment of the body to the fenders and the slope of the rear. Some engineers are claiming that more streamline efficiency can be achieved by attention to fenders, headlamps and other protruding parts than to the front and top of the body.

Nash, which as usual will be the first to spring its complete new line, is reported favoring the airflow design. Graham engineers are engaged in redesigning fenders and the rear slope of their bodies. The new low-price Packard, as indeed the entire line, will come more nearly falling into this third group than any other. Hupp, Studebaker, Reo, Hudson-Terraplane and Ford will probably remain there.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1932	1933	1934
January	119,344	130,087	156,907
February	117,418	106,888	231,707
March	118,959	118,002	331,263
April	148,326	180,713	354,745
May	184,295	218,347	331,641
June	183,106	253,387	308,051

Estimated by *Cram's Reports*

July 7	30,493
July 14	66,000
July 21	65,829
July 28	59,412

AGAIN with the reservation that July experiments are far from synonymous with December showings, Fisher Body may do something quite radical in bodies for 1935. It may go to all-steel body—and literally that, including the top.

Fisher bodies now are a composite of steel and hardwood. It is only a coincidence, Fisher officials say, but recently this division of General Motors has not been stressing the advantages it has always maintained for this type. It has not been inferring that the all-steel body was a design for the low-price car.

But having been identified so strongly with the composite body, Detroit is speculating that if, as and when Fisher makes the change to all-steel, it will go the entire length and contend that it is first with a complete all-steel design.

Some all-steel bodies of other automobile manufacturers have wooden floorboards. The few that use steel instead of wood for floorboards and make their bodies integral with the chassis have soft tops or an occasional wooden cross rail in the top. So far as known, no present body is 100 per cent all steel.

An all-steel top would offer Fisher something to capitalize, for one thing from the standpoint of safety. Heretofore, drumming and a desire to provide as low a center of gravity as possible have worked in favor of soft tops.

Anther advantage would accrue to steelmakers. Depending upon many variables, including slightly greater strength in the sides, an all-steel top body might average 100 pounds more business for sheet or strip mills. Since General Motors made about 700,000 cars in the first half of 1934, an all-steel top would have given the mills 35,000 tons more business.

Fisher officials will not comment on this report, stating that July is too early for any definite program.

Another body speculation for 1935 is whether air-conditioning is on its way. It is no secret, of course, that all of the larger body manufacturers are experimenting with it.

A spokesman for Chrysler, considering the recent venture of Walter P. Chrysler into air-conditioning units for homes, believes it will be 1936 before any headway is made. Presumably, if Fisher adopted an all-steel body, the basic design would visualize air-conditioning as integral in the near future.

The consensus of opinion in Detroit now is that air-conditionong in automobiles is certainly coming, that a few high-price lines may feature it for 1935, but it is not likely to become general before 1936.

NOTWITHSTANDING the weak stock market and other business indices whose normal ten-

dency is to freeze purchasing power, the automobile situation continues strong.

April, it will be recalled, was the peak of the first half, with 354,745 cars and trucks assembled. May developed a slight decline to 331,652 units. Now, the official statistics of the department of commerce put June production at 308,051 units.

July showed a further decrease, possibly to 250,000 cars and trucks, though most forecasts are around 275,000. This was some 50,000 more than in last July, and an increase of over 150,000 more than in July, 1932.

August will ease somewhat from July, but considering the season, will be a strong month. In fact, retail sales have held up so strongly that the horizon on 1934 cars may be considered as having been pushed back a month. Whereas a good many manufacturers expected to be near the end of their runs about Sept. 1, they will continue through September at a good rate.

Current releases for material, including steel, are largely to round out requirements for completing runs on 1934 jobs. When the last 1934 model has rolled off the line there will be little steel left in warohouses, though considerable pig iron. First buying of steel for 1935 series is looked for between Aug. 15 and Sept. 1.

Chevrolet is typical of the strength being displayed. In June its production was 98,147 units. July probably has topped 90,000 by a hair. For August the present schedule is 75,000, and for September the tentative schedule is 60,000. Output of trucks has been speeded up. Last week, Chevrolet assembled 19,000 units, only 1000 fewer than the week before.

Ford originally contemplated 135,000 cars and trucks for July and August combined. Last week its total was 18,350, compared with 20,350 the week preceding. Its August schedule is about 60,000 units. More experimental Ford cars are running about Michigan, some with a 4-cylinder engine, and there is a recurrence of rumors of a small Ford. That decision will be made personally by Mr. Ford, and at a time now unknown even to him.

Plymouth, which assembled 7000 cars last week, a reduction of 1750 from the preceding week, enters August with a schedule of about 30,000, which is a small reduction from the July total. Like Ford and Chevrolet, Plymouth finds the retail market basically strong, and has no immediate plans for ending the run on the present series.

Graham, which has been making about 300 a week of the current series, is devoting more time now to revising its own line than to making plans for the Continental series which it contemplates taking over. It has been expected that parts would be ordered shortly for a run of 5000 of the small job, but nothing definite has developed.

Hudson's recent experience is typical of many. In every week since early June with the exception of the week of July 4, retail sales have shown moderate but steady increase. Last week Hudson-Terraplane output was 925 units, an increase of 25. Export business in the first half year totaled 8218 cars, against only 2777 in the first half of 1933 and 4824 in all 1933. Canadian shipments of Hudsons and Terraplanes from Jan. 1 to July 20 plus current unfilled orders equal combined shipments for all 1932 and 1933.

Died:

WILLIAM HASTINGS BASSETT, 66, metallurgical manager, American Brass Co., Waterbury, Conn., and recently elected president of Amer-

William H. Bassett

ican Society for Testing Materials, at his home in Cheshire, Conn., July 21. Graduated from the Massachusetts Institute of Technology in 1891, he then became chemist with the Popes Island Mfg. Co., New Bedford, Mass. Later he became superintendent and remained with that company for five years. He then accepted a position as teacher of chemistry at Swain Free school, New Bedford, and remained there until 1900 when he became associated with the New Jersey Zinc Co. as chief chemist at their Newark, N. J., works. In March, 1902, he became chemist for the Coe Brass Mfg. Co. and in 1903 was made chief chemist and metallurgist of the American Brass Co. In 1912 he was made technical superintendent and metallurgist and in 1930 he became metallurgical manager.

He pioneered in the application of the spectroscope to routine work in the nonferrous metals industry and in the application of the microscope to the metallography of nonferrous metals. In 1930 he served as president of the American Institute of Mining and Metallurgical Engineers, and for years had been an active member of technical societies in this country and abroad.

No decision will be made concerning Mr. Bassett's successor as president of American Society for Testing Materials until the fall meeting of the executive committee. Dr. Hermann von Schrenk, consulting timber engineer, St. Louis, as senior vice president of the society, will assume temporarily the duties of the presidency.

□ □ □

W. M. Campbell, 41, superintendent of the Colorado Fuel & Iron Co.'s rolling mill at Pueblo, Colo., in that city, July 15.

□ □ □

Albenus C. Meyers, for 14 years traffic manager of the American Fork & Hoe Co., Geneva, O., in Lake Tongamong, Canada, from drowning.

□ □ □

Henry B. Bradford, for many years vice president of the Edge Moor Iron Co., Edge Moor, Del., at his summer home, Middle Neck on the Bohemia river, Cecil county, Md., July 25, after an illness of several months. At one time he was associated with the Baltimore & Ohio railroad and later with the Diamond State Engineering Co. In his years of association with the Edge Moor company he was active in the design of box head boilers, water tube boilers and other products.

□ □ □

E. A. Peden, 66, chairman of the board, Peden Co., Houston, Tex., in that city, as noted in STEEL for July 23. He founded the Peden Iron & Steel Co. in 1890, handling tinners' supplies, iron fencing, nails and barbed wire; it expanded steadily into one of the largest warehouse interests in the southwest. In 1930 the name was changed to the Peden Co. Prominent in civic, social and business affairs of Houston, Mr. Peden also was chairman of the board of the Houston Lighting & Power Co. and the Deepwater Oil Refinery; president of the Ship Channel Land Co. and the Goose Creek Oil Co.; and director of a number of Houston business organizations.

□ □ □

James M. Motley, president and director, James M. Motley & Co. Inc., New York, machinery dealer and exporter, at Point o' Woods, Long

(Please turn to Page 67)

Iron Ore Industry Periled by Tax and St. Lawrence Route

BY R. C. ALLEN
President, Lake Superior Iron Ore Association

I AM thinking of the Lake Superior region in connection with the broad problem of national security, and I propose to consider briefly from a national point of view some of the more obvious economic and political aspects of the exploitation of its natural iron ore deposits.

Of particular interest is the great acceleration in the consumption of minerals in the first third of this century. In that single generation there was consumed a greater quantity of metallic ores than in all preceding time. That is a matter of great significance, particularly if considered with another significant fact which is, that the rate of consumption of certain of the important minerals in that time has been in excess of the rate of discovery and development of additional supply sources.

Production Sources Shifting

There has been no shortage, rather an oversupply of most minerals. Nevertheless, we have witnessed in this generation the extinction of many great mines. We have seen whole mineral producing districts become exhausted or so depleted that activity has moved on to other fields where the cost of delivery to the consumer is lower. It is this shifting of the sources of production of newer, richer or better situated fields which is of ever present concern—not the exhaustion of the supplies of any mineral.

The shifting of production from one country to another of minerals so important as petroleum, copper, coal and iron affects our international relations, the relative industrial strength of nations and introduces new elements to be dealt with on the chess board of international politics. Could we look forward to a world at peace, trade channels open and commerce undisturbed by discriminatory obstructions, the mineral problem would be one of economics alone. But with the world as it is, considerations of national security and industrial self-sufficiency have to be reckoned with.

Only those nations depending in some degree on imports are secure who are able to command the trade routes and keep alive the sources of production which serve them. This is the explanation of the race for industrial self-sufficiency in which the Great Powers are the entries. In such a contest economic geography is the indispensable knowledge of the modern statesman.

It is said that the people of the United States covet nothing the world affords. That is no doubt largely true. There are deposits of a few indispensable minerals including manganese, chrome, vanadium and tungsten which we would rather have within our own borders. But it is true that we do not covet *much* the outside world affords. We should take no credit for it but we in fact imagine ourselves possessed of a peculiar national morality on account of it. We do not see that less fortunate peoples see in our outlook on world affairs merely the smug complacency of the rich and overfed. Our wealth and the advantages which flow from it are even now challenged in more than one quarter of the globe. It is not only the wealth of certain nations which is challenged internationally but within nations the wealth of individuals, corporations and institutions, even religious institutions, as well. The most significant thing in our political outlook at home and abroad is this challenge to wealth.

Control of Mineral Wealth

It would be interesting to dwell on the significance of some interesting facts brought forward by a study of geography in relation to modern history and to speculate on what the haphazard distribution of populations in relation to means of subsistence and progress mean to future generations if not indeed to this one. But I will mention only one. More than 75 per cent of the mineral wealth of the world is owned or effectively controlled by 10 per cent of the population, mainly of Anglo Saxon origin, living in the United States and British Empire.

You may speculate if you like on the influence of this unequal distribution of the world's natural riches on the existing international situation. The fact is that history of the last 400 years records the acquisition by two nations of Anglo Saxon origin of the ownership or control of a preponderant portion of the natural treasures of the earth. In my opinion the history of the next several decades will turn largely on the manner in which these two peoples meet the issues arising from the dominant position they have come to occupy in the general economy of the world.

I am glad that the United States can live unto itself if need be. Comparative economic independence is our security in peace and our strength in war. It should be the object of our external and internal policies to guarantee that strength and security to our children. I am no friend of any policy that would foster foreign trade to the detriment of wages and employment at home, that would curtail in the least degree to any of our people the opportunity here for an abundant living or that would weaken a single industry or activity necessary or helpful to our power on land and sea.

Resources Give Power to Owner

If you would understand what constitutes the greatest menace to the future of Europe, consider the territories of its western powers in relation to the most fundamental of its natural resources in minerals, coal and iron. The French have the iron, the Germans have the coal of the Rhinelands. When one or the other of these nations have both the coal and the iron of the Rhinelands the quarrel between them will have been settled. But that cannot happen with the consent of England and Italy. It would disturb the "balance of power." A war to establish unified political control of the interdependent natural resources of the Rhinelands is predictable with more certainty than the weather of tomorrow in Cleveland. If Canada were possessed of the Lake Superior iron ranges there would be a problem of "political unification" on this side of the Atlantic.

I trust that I have sufficiently emphasized the fact that industrial strength means world power, that it resides basically in co-ordinated mineral industries, that coal and iron are its indispensable foundation and that nations dependent on the importation of either coal or iron or both of these minerals exist precariously in a world at war. I have done this because I want you to realize the importance of the Lake Superior iron ore industry to the industrial strength and the security of this country, to help men in high office to realize it, and to help to put an end to certain political trends which threaten to weaken if not eventually destroy this bulwark of internal and external power.

It is no accident that the great bulk of the iron and steel of this country in their limitless useful forms from pots and pans to bridges and automobiles has been made in the upper Mississippi valley and lower Great Lakes regions. The great

Abstract of address before Ohio section, American Institute of Mining and Metallurgical Engineers, Columbus, O., June 22.

steel plants which feed the manufacturing industries of this region and much of the nation at large are there because the best of our metallurgical coals are there or near at hand, because the iron ores of Lake Superior are rich, abundant and cheaply mined and because the Great Lakes lie between the ore and the coal fields.

Early in the present century the iron and steel industry of the United States had surpassed that of any other country. During the 1920's it accounted for a little less than half of the production of the entire world. It has been the greatest single factor in the rise of this country to its present position of industrial strength. It is necessary to the maintenance of that strength. It was indispensable to the defeat of the Central Powers in the World War. It is necessary to the winning of any similar struggle in which this country may again be involved. It was at maximum service during the war because it was not dependent on sea-borne ore or coal. The security of the nation demands that it remain independent of sea-borne raw materials.

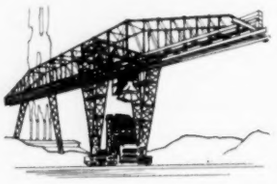
Limit on Rich Ore Supply

The iron mines of Lake Superior reached maximum development in the "Golden Twenties." In the closing year of that decade (1929) they sent down the Lakes over 66,000,000 tons of iron ore rich enough to smelt as it came from the mines excepting a relatively small portion which was enriched by washing out some of the impurities. There is enough ore of these kinds to support any probable shipment for a good many years but if as much as 50,000,000 tons per year is required it is probable that after 15 to 20 years improved methods of concentration adaptable to types of iron bearing rocks not now exploited would be necessary to supplement the shipments from what would then remain of the rich ores and the leaner ores which can be concentrated by the simple methods now in use.

About the beginning of that decade it became apparent that current shipments would probably exceed the quantity of ore currently discovered by development and exploration. The newest "range" or producing district, the Cuyuna, had been prospected over a period of 20 years. Exploration elsewhere had been so thorough that favorable prospects for new producing districts were thought to be nil and new ore bodies of great importance not to be found. It was certain that extensions of ore bodies not completely explored would furnish important additions to the reserve although probably not at a rate to replace shipments. Experience has shown that those beliefs were essentially correct in 1920; looking forward in 1934 they appear to be entirely so.

Discovery and development of the ore bodies of Lake Superior far beyond the needs for current production was essential to the development of the iron and steel industry on a sound financial basis. This industry accounts for an investment of approximately $5,000,000,000 of which no less than $4,000,000,000 is invested in plants and facilities depending on the iron ores of Lake Superior.

The justification for this huge investment is the assurance of long operating life, that is to say, an adequate supply of iron ore. That assurance was provided by exploration and development of the ore bodies of Lake Superior. But in other respects it would be better for the industry if less were known about the iron ore deposits of Lake Superior, better if much of the existing reserve were undiscovered, because of the extraordinary cost of carrying it. The mine operators are required to pay



every year a tax on each ton of it, royalties in advance of mining on that portion of it which is idle under lease and interest on these and other advance charges and suspended accounts.

During the depression a portion of this reserve has been relinquished, mainly an undeveloped portion but including some mines which have had a long record of production and prospects of long future life. It is probable that a further portion of it will be relinquished because the reduced carrying charges are still out of proportion to present and prospective rate of production and income.

Helpful adjustments in some of the leases have been brought about with the co-operation of fee owners but taxes are an ever mounting charge, advancing from less than $9,000,000 per year before the war to more than $26,000,000 in 1929, only a little less than the total sum paid for wages at the mines in that year which was $29,286,000. In Minnesota, where about two-thirds of the ore is produced, the tax cost actually exceeds the labor cost of production. It normally amounts to one-quarter of the market value of the ore at the mines.

In Michigan and Wisconsin the mines are taxed fairly under the ad valorem system like other property. But not so in Minnesota where a dollar of value in an iron mine is assessed for taxation by the law's requirement, at double the amount of the farmer's dollar and 50 per cent more than the city man's dollar in real estate. Permission to work this discrimination was given to the legislature by voting the "uniform rule" out of the state constitution in favor of classification of property for taxation at different levels in relation to value. It sufficed for a while. Then came an additional tax of 6 per cent on the net income as a charge against the "occupation" of iron mining and a tax on the royalty paid by the operator in the amount of 6 per cent of it.

A further discrimination against the mines was enforced in 1932 when the Minnesota tax commission recognized the devastating effect of the depression by reducing the assessed value of other real estate for taxation, refusing at the same time any relief to the mines. A number of the operators then appealed to the courts, whereupon, the political party in power countered in 1934 by declaring in convention for the confiscating of mining property by the state. It will be interesting to note the reaction to that political plank at the polls and, if it be endorsed, the reaction of the other states to the proposal of one of them to "sovietize" commerce in an indispensable commodity.

Producers Snap Up Property

Radical political thought in Minnesota is awake to the undeniable facts that the iron mines are working on a diminishing measurable reserve and that most of the reserve is within the borders of that state. The rapidity with which that reserve was depleted in the twenties was a matter of concern to the industry itself, and led some of its members into expensive projects to increase their respective shares of it. Marginal properties of doubtful value, tracts of iron bearing formation in which prior exploration had been indecisive and even "wild cat" lands were purchased or leased until at the end of the decade almost every tract of any promise had been acquired by some producer of ore. Nearly all of the producers were buttressing their positions in the dawn of the "new economic era" against the prospect of continued acceleration of shipments.

In the half century preceding 1910 the Lake Superior mines had shipped about one-half billion tons but in 20 years following 1910 they shipped a billion tons. The people of Minnesota were alarmed by such heavy shipments from a diminishing visible reserve. Their tax laws express a deliberate intention to require of the ore all it can pay against the time when there will be no ore to tax.

You see now that looking forward in the twenties there was sound reason to question the ability of the

(*Please turn to Page* 39)

Industrial Men in the Day's News

Snowden Samuel, President, Frank Samuel & Co. Inc.

Phillips Studio

He succeeds his father as head of this company, which sells steel, iron, iron ores and ferroalloys.

He also is president of the American-Swedo Iron Co., with which he has been associated since 1912.

Active in technical society work, he assisted in formation of the Wrought Iron Research association.

SNOWDEN SAMUEL, who as noted in STEEL for June 4 has succeeded his father, the late Frank Samuel, to the presidency of Frank Samuel & Co. Inc., Philadelphia, steel, iron, iron ores and ferroalloys, has been active in the iron and steel industry for more than a score of years.

His first affiliation was in 1912, with the American-Swedo Iron Co., Danville, Pa., a company he now heads as president. He worked first as laborer, then puddler and finally chemist. After two years he became connected with Frank Samuel & Co. as salesman.

Following 18 months in France with the army field signal corps during the World war, in 1919 he returned to his old position with the Samuel company and also in that year became secretary and treasurer of the American-Swedo Iron Co. Two years later he was made a partner in the former company and in 1932, secretary and treasurer. These positions he held at the time of his recent election to the presidency.

A native Philadelphian, Mr. Samuel was born Dec. 26, 1893, and was graduated from the Protestant Episcopal academy, Philadelphia, in 1912. Active in various organizations, he assisted in the formation of the Wrought Iron Research association and in 1928 served as secretary and treasurer. He is a member of the American Iron and Steel institute and of the American Institute of Mining and Metallurgical Engineers.

□ □ □

William Steytler, for the past five years district sales manager of the Philadelphia office of Pittsburgh Steel Co., has been apponited district sales manager of the company's Detroit office. He entered employ of the company in 1913 at its Monessen, Pa., plant. In 1917 he was transferred to the Pittsburgh sales office where he was active until 1929.

C. Leslie Wade succeeds Mr. Steytler as manager of the Philadelphia office. He has been with the company since 1910, in Pittsburgh, Detroit, Chicago and St. Louis sales offices.

□ □ □

H. L. Rankin has been named manager of the Elmira, N. Y., plant of the American Bridge Co. which has been placed back in production after an idleness of two years. Formerly assistant manager of the plant, lately he has been with the company in Toledo, O.

□ □ □

D. P. Heath, Detroit consulting engineer, has been appointed assistant to J. D. Harris, chief engineer of the McCord Radiator & Mfg. Co. Detroit.

□ □ □

A. D. Hunt recently was appointed manager of engineering at the South Philadelphia works of Westinghouse Electric & Mfg. Co., succeding John M. Lessells, who has resigned to open a consulting engineering practice.

□ □ □

Kenneth Williams has been appointed manager of sales for the department of engineering and construction of Byllesby Engineering & Management Corp., Chicago. The department is expanding its activities to include general engineering practice for independent clients. At one time, Mr. Williams was active in sales and engineering work for the Edge Moor Iron Co. in the Chicago district.

□ □ □

Dr. M. F. Jackson, head of the agricultural department of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been chosen a member of the agricultural committee of the International Kiwanis.

□ □ □

Alphonse F. Brosky, formerly consulting editor, *Coal Age*, and during the past winter assistant fuel adviser to the Federal Surplus Relief Corp., Washington, has been appointed special engineer of the Jeffrey Mfg. Co., Columbus, O.

□ □ □

Wililam H. Pouch, president of the Concrete Steel Co., New York, has been named chairman of the industrial advisory committee of the New York Federal Reserve bank. The committee will pass upon all industrial loans to be made direct, either by member banks or by the Federal Reserve bank of New York, which come within the scope of the law making available $580,000,000 of federal funds.

□ □ □

Maj. Aaron E. Carpenter has been elected president and general manager of E. F. Houghton & Co., Philadelphia. He has been with the company 29 years, was a member of the original board, and served as treasurer from 1921 to 1929, when he became first vice president. He repre-

Maj. Aaron E. Carpenter

(*Please turn to Page* 66)

EDITORIAL

Only a New, Square Deal Can Save NRA from Failure

WHEN President Roosevelt signed the national industrial recovery act on June 16, 1933, he believed it would prove to be a powerful agency in lifting the nation from the depths of depression. His high appraisal read as follows:

> "History probably will record the national industrial recovery act as the most important and far-reaching legislation ever enacted by the American congress.
>
> "It represents a supreme effort to stabilize for all time the many factors which make for the prosperity of the nation and the preservation of American standards.
>
> "Its goal is the assurance of a reasonable profit to industry and a living wage for labor with the elimination of the piratical methods and practices which have not only harassed honest business but also contributed to the ills of labor. . . .
>
> "Obviously, if this project is to succeed it demands the whole-hearted co-operation of industry, labor and every citizen of the nation."

In the light of 13 months' experience with NIRA, no one will contend that it has lived up to the expectations of the President, or of its other sponsors. That it has fallen so far short of the success anticipated is due, not to the failure of industry, labor and citizens of the nation to co-operate whole-heartedly, but to the erratic administration of the act by the government itself.

Invited Industry into "Partnership," Which Has Proved To Be a One-Sided Affair

Looking back, it is easy now to see how thoroughly those responsible for the new deal broke faith with industry, labor and the public.

The President invited industry into a "partnership" with government. In practice, this partnership has proved to be a one-sided affair, in which the government has attempted to impose its will upon industry arbitrarily. Industries, whose leaders were cautious enough to ask for safeguards against government confiscation of their rights, were ridiculed by the Chief Executive and his lieutenants. President Roosevelt told the newspaper publishers that a guarantee of freedom of the press was not necessary in their code because such freedom was specified in the constitution of the United States. Yet a few months later, a government prosecutor argued that the Weirton Steel Co. could not assail the constitutionality of NIRA because, having accepted benefits under the act, it automatically was estopped from challenging its constitutionality.

Time and time again, an industry has labored diligently to formulate a code only to have it drag for months in the meshes of NRA bureaucracy, after which it was emasculated or completely revamped and then hurriedly thrown at the industry for acceptance on short notice. In what degree can the government claim good faith in its recent handling of the structural steel code?

Government Has Harmed Employe Relations More Than It Has Advanced Them

The new deal treatment of labor under NRA has been a farce. In ignoring the 85 to 90 per cent of employers who have no leaning toward professional labor unions, it perpetrated an act of inexcusable discrimination. In pretending to offer professional labor union leaders more advantages than it could possibly deliver, it put itself in the position of having to double-cross these leaders eventually. In mishandling Section 7a from the beginning, it encouraged radicals, undermined the experienced union labor leaders, and contributed to industrial strife. The new deal definitely has failed to keep faith with labor—professional or independent.

In its relation to the American public, the administration of NIRA has been notoriously inconsiderate. In exchange for public support of the blue eagle, the new dealers have exhibited such vacillating policies that no one knows whether the government stands for high prices or low prices, monopoly or competition, closed shop or open shop, etc. The government itself has encouraged boycotting, price chiseling, price fixing, strikes, lockouts, etc., and at other times has discouraged these activities. How inconsistent, how demoralizing are these examples set by the federal government for the enlightenment of the public!

If NRA is to escape the stigma of becoming a dismal failure, its administrators must act immediately to adopt sound, continuing policies. They must cease to send out ambiguous, misleading interpretations. They must quit changing course every time a senator goes on the warpath. Above all, honesty and sincerity of purpose must replace trickery and evasion. These changes are imperative if NRA is to regain the faith of industry, labor and the public.

THE INDUSTRIAL DIAL

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The Business Trend Section of STEEL
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AS THE end of this disappointing month of July approaches, the listlessness of business is relieved slightly by the appearance of several signs of favorable import.

The weekly barometers improved encouraging after the sharp dips early in the month. Freight car loadings recovered fairly well, although they remain below corresponding 1933 levels. Electric power output, which in the week ending July 14 fell below that of the comparable 1933 week, increased in the week ending July 21 to 1,663,771,000 kilowatt hours, thus regaining a lead over last year's output. On the other hand, steelworks operations remained below 30 per cent, soft coal output dropped below the 1933 figures for the first time and business failures increased slightly. Automobile assemblies in the fourth week of July held closely to the gratifying levels of the two preceding weeks.

Reports of industrial earnings for the second quarter should inject a note of cheer into business news. In the majority of cases the second quarter was better than the first and also than the second quarter last year. Of the first 154 reports scanned by Brookmire Inc., 101 showed improvement and 53 reflected less favorable conditions.

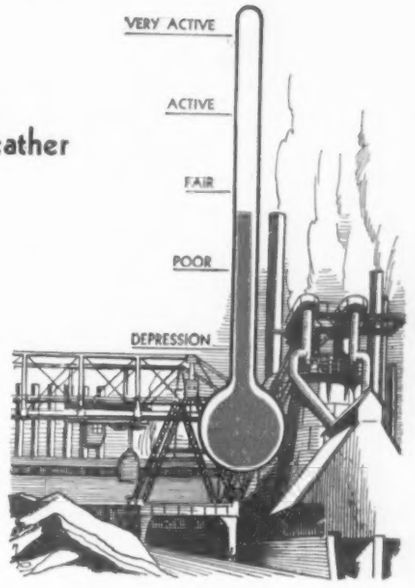
Labor trouble seems to be diminishing as the end of July draws near. The slackened pace of industrial activity should act as a deterrent to strikes. Another, and perhaps a more powerful, argument against walkouts is furnished by the collapse of the attempted general strikes and the attendant shift in public opinion against the tactics of strikers.

Still another favorable factor is found in the predicament of NRA. Its ill advised administration in recent weeks has placed it on the defensive against attacks from many sources. It has given industry many raw deals—some of them unintentionally. There are signs that henceforth a more moderate attitude will be displayed—that the olive branch may be ex-

Industrial Weather

TREND:

Listless



The Barometer of Business

Industrial Indicators

	June, 1934	May, 1934	June, 1933
Pig iron output (daily average, tons)	64,563	66,370	42,165
Machine Tool Index	42.6	46.8	15.5
Finished steel shipments (tons)	985,337	745,063	603,937
Ingot output (daily average, tons)	115,999	124,174	99,904
Dodge Bldg. awards in 37 states (sq. ft.)	13,986,500	14,664,400	16,075,400
Automobile output	321,956	351,802	260,645
Coal output, tons	26,430,000	28,100,000	25,320,000
Business failures, number	1,033	977	1,648
Business failures, liabilities	$23,868,293	$22,560,835	$35,344,909
Cement production, Bbls.	8,786,000	8,554,000	7,804,000
Cotton consumption, bales	363,000	519,765	696,472
Car loadings (weekly av.)	615,640	604,039	566,345

Foreign Trade

	June, 1934	May, 1934	June, 1933
Exports		$160,207,000	$119,900,000
Imports		$154,647,000	$122,000,000
Gold exports		$1,780,000	$4,380,000
Gold imports		$35,362	$1,136,000

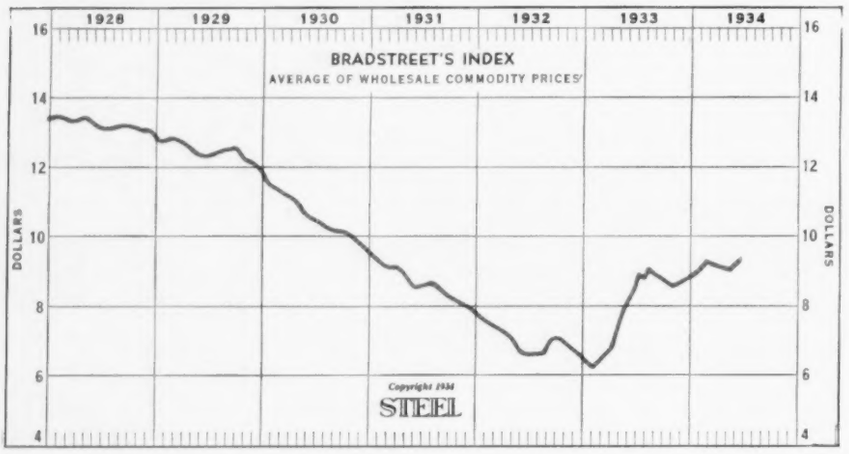
Financial Indicators

	June, 1934	May, 1934	June, 1933
25 Industrial stocks	$133.14	$131.17	$134.53
25 Rail stocks	$34.38	$34.15	$36.01
40 Bonds	$82.55	$82.24	$73.45
Bank clearings (000 omitted)	$19,597,012	$17,952,982	$19,710,228
Commercial paper rate, N. Y. (per cent)	1	1	1¾–2
*Commercial loans (000 omitted)	$4,485,000	$4,550,000	$4,704,000
Federal Reserve ratio, per cent	69.2	69.0	68.8
**Railroad earnings	$39,494,980	$32,264,611	$41,042,628
Stock sales, N. Y. stock exchange	16,802,460	25,343,000	125,627,124
Bond sales, par value	$267,056,000	$284,742,800	$377,745,900

*Leading member banks Federal Reserve System.
**May, April and May, respectively.

Commodity Prices

	June, 1934	May, 1934	June, 1933	Monthly Av. 1913
STEEL's composite average of 14 iron and steel prices	$34.89	$34.77	$28.73	$26.32
Bradstreet's index	$9.23	$9.14	$8.33	$9.21
Wheat, cash (bushel)	$1.12	$1.07	$1.04	92c
Corn, cash (bushel)	73c	66c	63c	51c
Petroleum, crude (Bbl.)	98c	98c	42c	$2.50



	1934	1933
July 1	$9.23	$8.33
June 1	9.14	8.02
May 1	9.15	6.98
April 1	9.16	6.53
March 1	9.26	6.35
February 1	9.01	6.53
January 1	8.83	6.79

tended in some cases to reassure industry of NRA's sincerity. This policy also is apparent in other government actions. Chairman Kennedy of the new securities commission Wednesday went to great lengths to persuade business men that his board does not intend to obstruct legitimate trading. The federal reserve representatives, speaking on loans to industry, are stressing the point that a loan will not mean government interference.

Possibly these signs mean the government realizes it has gone too far in strangling business.

Where Business Stands

Monthly Average, 1933—100

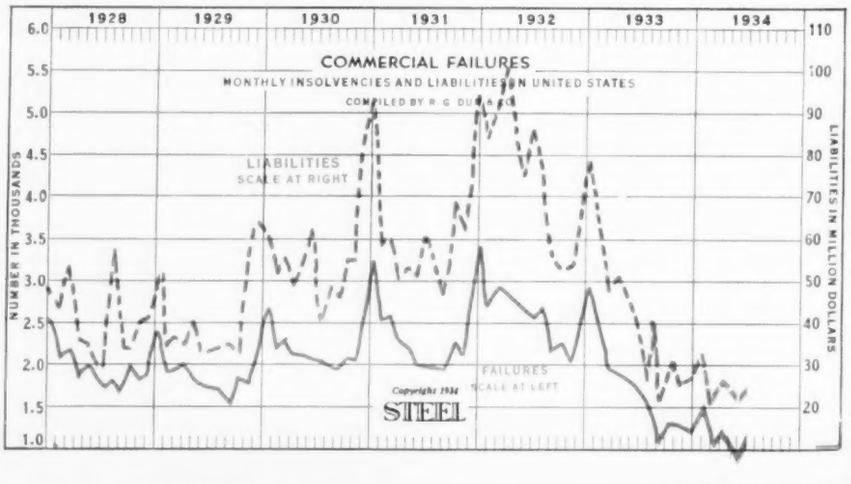
	June, 1934	May, 1934	June, 1933
Steel Ingot Output	156.9	170.5	135.4
Pig Iron Output	178.2	182.9	116.4
Freight Movement	110.5	108.5	101.7
Building Construction	114.1	119.7	131.2
Automobile Output	190.8	208.5	154.5
Wholesale Prices	117.4	116.3	106.0

Commodity Price Index Advances 10.8 Per Cent From Year Ago

The Dun & Bradstreet index of wholesale commodity prices on July 1 advanced 1 per cent to $9.23. The general trend of commodity prices during the month was upward enabling some of the indices to reach the highest level since late in 1930 or early 1931. However, toward the close of the month, a weakness appeared in quotations which was attributed chiefly to the break in the grain markets, as the result of the improved crop outlook. The index on July 1, 1933, stood at $8.33 making an increase of 10.8 per cent in the commodity price level in the past twelve months.

Commercial Failures 37.3 Per Cent Below Last Year

Commercial failures in the United States in June totaled 1033, an increase of only 56 from the 977 recorded for May. In June, 1933, there were 1648 failures, which makes a decline of 37.3 per cent. Total liabilities reported in June amounted to $23,868,293 as compared with $35,344,909 reported in June, 1933. The amount of the liabilities involved in this year's bankruptcies has been substantially lower, compared with the dollar losses of a number of years past.



Number	
June, 1934	1,033
May, 1934	977
June, 1933	1,648

Liabilities	
June, 1934	$23,868,293
May, 1934	22,560,835
June, 1933	35,344,909

FIG. 1—Here are shown two 7000-gallon milk storage tanks fabricated from 10-gage, 18-8 chrome-nickel stainless steel. All seams are butt welded, ground smooth and polished on the inside. Insulated with 2 inches of corkboard, the tanks are covered with 12-gage blue annealed sheet steel with all seams welded

SUCCESSFULLY FABRICATES STAINLESS STEEL FOR MANY APPLICATIONS

BY W. J. WACHOWITZ
President, Alloy Products Corp.,
Waukesha, Wis.

DURING the past several years, leading steel producers have spent considerable time in research and development work connected with the production of solid stainless steel. At the outset, most of them experienced a great deal of difficulty, but in recent years they have developed stainless, especially the 18-8 chrome-nickel type, to a point where there need be no hesitancy in utilizing the material for various suitable applications.

The Alloy Products Corp., Waukesha, Wis., is a pioneer fabricator and one of the country's specialists in designing, fabricating and welding stainless steel equipment. It has manufactured approximately 800 various types and sizes of units which are being used in most of the nationally known dairy, food, brewery, chemical, packing and canning plants. From its experience and the repeat business which is being obtained, the company is satisfied that stainless steel is here to stay. Most of the stainless steel fabricated by this company has been produced by the Allegheny Steel Co., Brackenridge, Pa., one of the first to make the 18-8 alloy.

Stainless now is being used in various industries for the handling of milk, beer, tooth paste, shaving cream, breakfast foods, food products in general, and many other special applications. The Alloy Products company has spent considerable time in research and development work producing stainless steel welding wire and flux, which is considered essential in the fabrication of stainless.

In the past two or three years, the company has made special efforts to have steel mills produce stainless steel wire with low carbon content in order to eliminate corrosion and brittleness in the welds. It was found from experience that in producing equipment for various types of products having high acidity, there is a tendency for the metal or the welded joints to be attacked. In years past, this was supposed to have been eliminated by annealing the stainless steel after fabrication, but 90 per cent of the larger equipment which had been annealed and not cooled properly had failed. This fabricator has done very little annealing, the reason being that work strains were eliminated in the course of fabrication and in the use of proper welding methods.

Experience has shown, first, that the proper welding wire must be selected and coated with a flux to eliminate oxide, and, second, that proper preheating methods must be followed. In spite of the great care taken to produce a

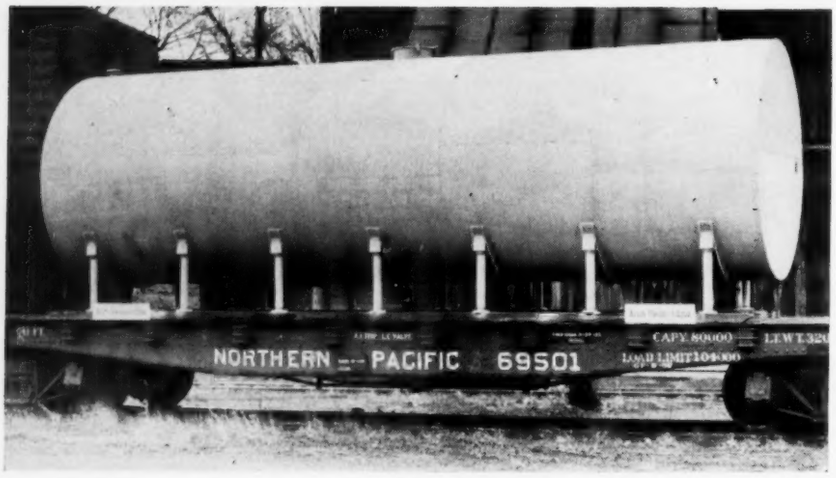


Fig. 2—White pickled finish, 25 per cent stainless-clad steel, $\frac{3}{16}$-inch thick, was used in fabricating this 9800-gallon tank for ammonia oxidation of nitric acid. The tank is 8 feet in diameter and 26 feet long with dished and flanged heads. All seams are butt welded and polished on the inside

sound weld, it has been found essential to have the welding machine run at the rated speed and the generator cleaned periodically so that it will deliver a constant current. A large number of stainless steel units have been fabricated in recent months and little difficulty has been experienced because the company gives great care to design, raw materials, welding rod and welding machines.

Fig. 1 illustrates two of many large stainless steel tanks which have been built. These tanks, each of 7000-gallon capacity, are 10 feet in diameter and 11 feet high on the straight side; the material from which they were made is 10-gage 18-8 steel supplied by the Republic Steel Corp., Youngstown, O. The heads are dished and flanged. The insides of the tanks are polished and all seams are butt welded, ground smooth and polished. Insulated with 2 inches of corkboard, the tanks are covered with 12-gage blue annealed sheet steel with all seams welded. These tanks were shipped recently to Borden's Milk Products Co. Inc., Dixon, Ill.

Advantages of Clad Steel

The past three years or so have been spent in research and development work fabricating stainless-clad steel. This steel is produced by placing two plates of polished stainless face to face but separated with an insulating material. These plates then are inserted in an ingot mold and mild steel is poured in to make the ingot. After this ingot is rolled down to the desired thickness, its two ends and sides are sheared thereby producing two sheets with stainless steel on one side and mild steel on the other. Thickness of sheets made in this way varies from 18-gage up to 1-inch. Stainless clad steel has great possibilities and advantages over solid stainless steel for certain applications for it costs less and works easier.

When stainless steels were first introduced, considerable difficulty was encountered in attempting to weld them. Admittedly, there was much to be learned in the handling of this new metal and it was to be expected that a number of failures would occur in application, particularly where welding was involved. In the course of time, improved welding rods, better welding control and better procedure were developed, with the result that today no difficulty is experienced in welding 18-8 steel.

With introduction of the stainless-clad steels, the situation regarding welding was similar to that which existed when solid stainless steel was placed on the market. But here again, the difficulties at first encountered have been eliminated entirely with the perfection of welding procedure. Some engineers, however, still are under the impression that from a corrosion resistance standpoint, weldability of clad sheets is open to question.

With reference to corrosion resistance of welds made on stainless-clad sheets, the principal question hinges on whether any carbon steel is dissolved in the weld of the stainless steel. The Alloy Products company has done considerable work on this subject and tests made have proved that with proper welding procedure the carbon steel will not dissolve in the stainless steel during welding.

Test Shows Weld Quality

A striking proof of this is shown by results of a test in which two pieces of stainless clad were welded together and the specimen then boiled in concentrated nitric acid for approximately 76 hours at 185 degrees Fahr. All of the mild steel adjacent to the weld was dissolved, but there was no visible effect whatever on the stainless part of the weld. This test is only one of many which have been conducted on various gages of stainless-clad sheets.

One explanation of the corrosion resistance in and at the weld is that there is no precipitation in the weld metal because the mild steel absorbs the heat more rapidly than the solid stainless cladding. Therefore, there

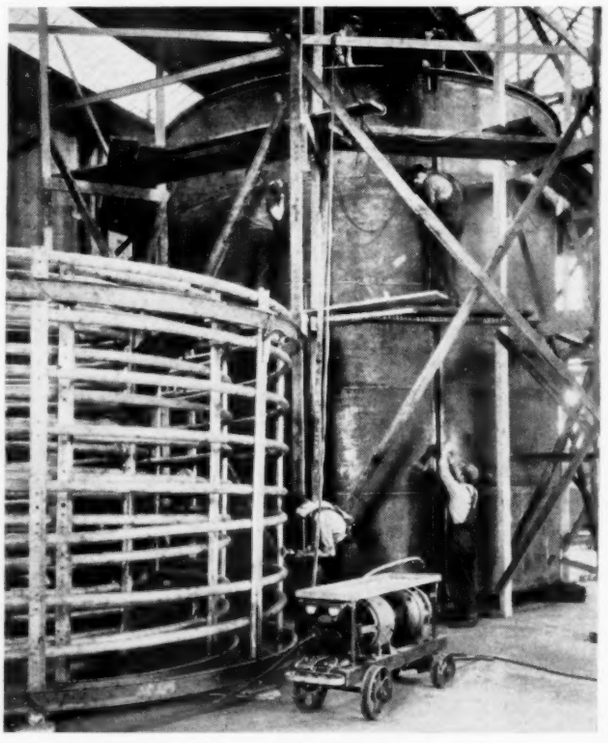


FIG. 3—A 38,000-gallon yeast propagator with attemperator coil. The tank, 18 feet in diameter and 20 feet high, is built of $\frac{3}{16}$-inch, 20 per cent stainless-clad steel. The coil consists of 1040 feet of stainless tubing

is a tendency for the stainless to anneal itself somewhat during the welding procedure.

Incidentally, it has been found that the stainless clad is considerably easier to weld than the solid stainless sheet if the proper method is used. Other advantages of using stainless clad are that work strains do not develop as readily as they do with solid stainless steel because of the mild steel backing.

Fig. 2 shows a tank of 9800 gallons capacity made of 3/16-inch, 25 per cent white pickle finish, stainless-clad steel furnished by the Ingersoll Steel & Disc Co., Chicago. It is 8 feet in diameter and 26 feet long on the straight side, with dished and flanged ends. All seams are butt welded and polished on the inside. The tank is used for storing 40 degree Baume ammonia oxidation nitric acid and was shipped to the Kentucky Color & Chemical Co., Louisville, Ky., late last year.

What is believed to be the largest unit of its kind in the world, a yeast propagator with attemperator coil, is shown in Fig. 3. The tank is built of 3/16-inch, 20 per cent, stainless-clad steel with all seams butt welded and polished on the inside. This steel also was supplied by the Ingersoll Steel & Disc Co. The tank is 18 feet in diameter and 22 feet high overall and has a capacity of 38,000 gallons, or approximately 365,000 pounds of weight on the inside.

For Field Assembly at Brewery

The tank shell is built in four sections, the cover in two sections, with an additional bottom section, as shipment could not be made otherwise. Shipped to Anheuser-Busch Inc., St. Louis, late in June, the tank was to be erected and assembled in the field and the seams of the five sections welded and ground smooth on the inside.

In the bottom of this tank is an aerating system which has a 12-inch diameter header, made of 12-gage Allegheny metal with all seams butt welded and ground smooth. There is approximately 54 feet of longitudinal 5-inch and 7-inch half-round air header on which are welded fifty 1½-inch flanges with fifty 1½-inch white pickled pieces of National stainless tubing, 14-gage wall and 29 inches long, with caps on the ends. In each tube there are 496 1/16-inch holes drilled, or a total of 24,800 holes.

On top of this is inserted an attemperator coil, shown in Fig. 4, consisting of three Globe seamless tube coils made of 3-inch 16-gage wall, white pickled 18-8 seamless tubing. The inside coil is 6 feet 7 inches in diameter and 10 feet high; the center coil is 11 feet in diameter and 10 feet high; the outside coil is 14 feet 4 inches in diameter and 10 feet high, making a total of approximately 1040 feet of tubing in the unit. All tubing was rolled for the proper pitch to drain, with headers accommodating the three sets of coils as one unit.

The coil supports are special vertical channel columns of 10-gage solid stainless steel with special sliding fitting on plate supports welded to the bottom of the tank. All columns are provided with special adjustable struts placed radially, terminating at the tank wall.

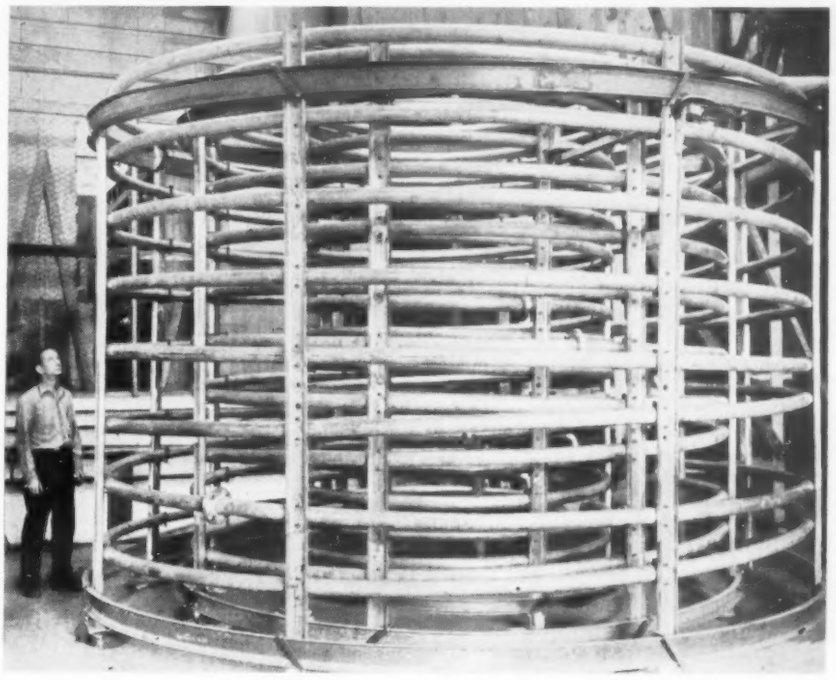


Fig. 4—The attemperator coil for the yeast propagator shown in Fig. 3 consists of three concentric coils of 14 feet 4 inches, 11 feet, and 6 feet 7 inches diameter, respectively. They required 1040 feet of 3-inch, 16-gage seamless stainless steel tubing. Coil supports are 10-gage solid stainless steel

Meeting Program Arranged By Wire Association

The Wire association has announced the program for its annual meeting to be held in New York, Oct. 1-5, in connection with the National Metal congress and exposition. Headquarters will be maintained at Hotel New Yorker, where technical sessions will be held both morning and afternoon on three days beginning Oct. 2. All of Monday, Oct. 1, will be devoted to registration.

Richard E. Brown, 17 East Forty-second street, New York, is secretary of the association.

The detailed program of technical papers is as follows:

Tuesday, Oct. 2

MORNING

Galvanizing and Corrosion-Resisting Coatings

"Corrosion and Hot Galvanizing," by Allan B. Dove, chemical engineer, Canada works, Steel Co. of Canada Ltd., Hamilton, Ont.

"Galvanizing," by U. C. Tainton, consulting engineer, Baltimore.

AFTERNOON

Electrolytic Copper—Lubrication

"Smelting, Casting and Rolling of Electrolytic Copper," by W. S. Adams, superintendent of rolling mills, and Mr. Miller, superintendent of furnace refinery, Anaconda Copper Mining Co., Great Falls, Mont.

"Lubrication for Drawing Copper Wire in Three Stages—Heavy, Medium and Fine Wire," by John G. Richards, wire mill lubricating engineer, G. Whitfield Richards, Philadelphia.

Wednesday, Oct. 3

MORNING

Annealing and Heat Treating—Steel Wire Manufacture

"Bright Annealing of Wire in Electric Furnaces," by O. S. Haskell, industrial heating engineering department, General Electric Co., Schenectady, N. Y.

"Steel Wire Manufacture," motion picture showing processes of Youngstown Sheet & Tube Co., Youngstown, O.

AFTERNOON

Braiding and Covering Wire

Joint session with Braiding and Wire Covering Machinery Manufacturers assocation.

Annual meeting of Wire association. Presiding: President John Mordica, superintendent, rod and wire mill, Bethlehem Steel Co., Sparrows Point, Md.

Award of Wire association medal.

Thursday Oct. 4

MORNING

Spring Wire—Lime Coating

"Properties and Manufacture of Spring Wire," by E. J. P. Fisher, physical metallurgist, Keystone Steel & Wire Co., Peoria, Ill.

"Lime Coating of Rod Versus Silicate of Soda or Trisodium Phosphate," by H. G. Hobbs, Cleveland.

AFTERNOON

Copper from Mine to Wire

"Canadian Copper from Mine to Wire User," by D. Horsfall, works manager, Canada Wire & Cable Co., Toronto, Ont.

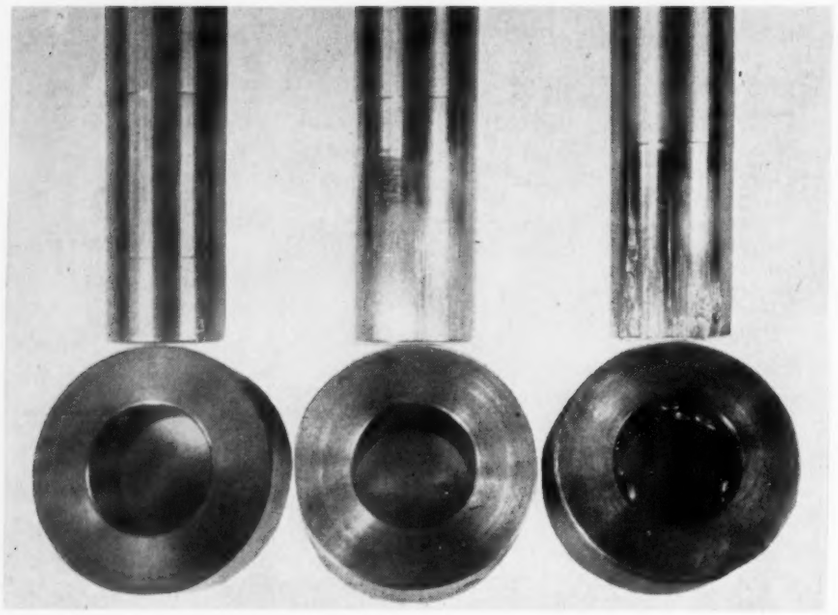


Fig. 1—Disassembled pins and rings. At the left is shown a brass ring on a brass pin; in the center, a steel ring on a brass pin; and at the right, a steel ring on a steel pin

Measures Slip Resistance of Metals in Shrink Fits

BY W. H. SWANGER
National Bureau of Standards

MAKING shrink fits by refrigerating the inner member offers an easily accomplished alternative when the converse method of expanding the outer member by heat is not practicable or permissible. The accompanying article, prepared from a paper read before the annual meeting of the American Society for Testing Materials in Atlantic City, June 25-29, presents data on axial slip resistance developed between cylindrical rings and pins assembled by contracting the pins in bath of acetone containing dry ice. The author is metallurgist, national bureau of standards, Washington

IT HAS long been known that considerable holding power is developed by a shrink fit in which a collar or ring is expanded by heat sufficiently to slip over a shaft or spindle which is from 0.001 to 0.002 inch per inch of diameter larger than the inside diameter of the ring at room temperature. When it is either not practicable or permissible to heat the ring, satisfactory shrink fits can be made by the converse method of cooling the pin or shaft.

The use of liquid air as the cooling medium, described by Whittemore in 1922, is limited in commercial application by the difficulties in obtaining and handling large quantities of liquid air. The use of solid carbon dioxide as a conveniently transported refrigerant has become common within recent years. By adding "dry ice" to a bath of acetone or other suitable liquid, temperatures of —70 to —80 degrees Cent. (—94 to —112 degrees Fahr.) can readily be attained. Cooling a shaft of brass from 20 degrees Cent. (68 degrees Fahr.) to this temperature will decrease its diameter approximately 0.0018 inch per inch of diameter. This is enough to permit the assembly of a cooled shaft into a ring which is sufficiently smaller than the shaft when both are at room temperature so that holding power adequate for many purposes is obtained after the shaft has warmed up.

Expand Outer Member by Heat

A material having a much smaller coefficient of expansion than brass, steel for example, may not shrink enough in dimensions when cooled in a bath of dry ice to make a tight fit in this manner. The difficulty frequently can be overcome by warming the outer member in hot water before attempting to slip it over the cooled shaft.

The resistance to slip between a shaft and encircling ring, assembled by a shrink fit, is dependent only partly upon the amount by which the shaft diameter at room temperature exceeds the diameter of the hole; it may also be influenced decidedly by the extent to which seizing takes place on the two metal surfaces in close contact. Seizing is more likely to occur in a shrink fit made by refrigerating the inner member than in one made by expanding the outer member by heat, if, in the latter case an oxidized surface tending to inhibit seizing is formed on the heated member. It is well known, however, that materials differ decidedly in their ten-

Dimensions of Pins and Rings and Force Necessary To Separate Them

	Diameter at 20° C. (68° F.), inches		Oversize of pin at 20° C. (68° F.), inches	Diameter of pin at —80° C. (—112° F.), calculated, inches	Diameter of ring at 100° C. (212° F.), calculated, inches	Diametral clearance when assembled, calculated, inches	Resistance to initial slip, lb. per sq. in. of contact area	Maximum resistance developed lb. per sq. in. of contact area
	Pin	Ring						
Brass ring on brass pin	1.0009	0.99964	0.00126	0.9991	.....	0.00054	722	1430
Steel ring on brass pin	1.00211	1.00075	0.00136	1.00031	1.00163	0.00132	1700	2100
Steel ring on steel pin	1.00225	1.00081	0.00144	1.00115	1.00169	0.00054	1820	6050

Dimensional measurements were made by the gage standardization section of the bureau of standards. Diameters of the pins were measured with a Pratt & Whitney measuring machine. Internal diameters of the rings were measured with a John Bath internal micrometer.

dency to seize. This is clearly shown by the experiments in which the resistance to slip under tension was measured on shrink fits between brass on brass, brass on steel, and steel on steel.

Cylindrical pins approximately 1 inch in diameter were machined from 2-inch bars of yellow brass and machinery steel. The composition of the brass was: 61.3 per cent copper, 2.9 per cent lead, less than 0.1 per cent iron, and, by difference, 35.7 per cent zinc. The brass had a brinell hardness number, 10-millimeter ball, 500-kilogram load, of 90; and a Rockwell hardness number, B scale, 1/16-inch ball, 100-kilogram load, of 54. The brass had a duplex or α-β structure with lead disseminated in fine particles throughout. The steel contained 0.12 per cent carbon and 0.14 per cent sulphur. The steel had a brinell hardness number, 10-millimeter ball, 3000-kilogram load, of 187; and a Rockwell hardness number, B scale, 1/16-inch ball, 100-kilogram load, of 90.

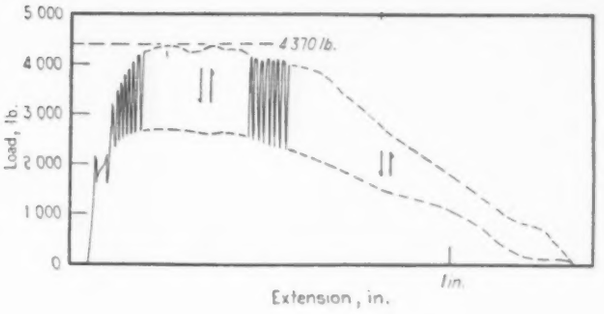


FIG. 2—Load-slip diagram of a brass ring pulled from a brass pin

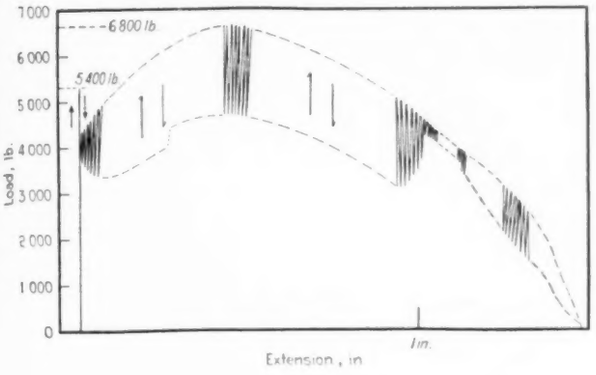


FIG. 3—Load-slip diagram of a steel ring pulled from a brass pin

Parts Were Truly Cylindrical

One end of each pin was left at the original diameter of the bar so as to form a head. The other end was carefully ground so that it was truly cylindrical to within less than 0.0001 inch over a length of about 2 inches from the end. Cylindrical rings slightly longer than 1 inch were prepared from the same materials with holes approximately 1 inch in diameter. They were slightly bell mouthed at each end and were carefully reamed to be truly cylindrical to within less than 0.0001 inch over a length of 1 inch. The diameter of each pin at room temperature was about 0.0015 inch larger than the inside diameter of the corresponding ring which was to be slipped over the pin. The diameters measured at 20 degrees Cent. (68 degrees Fahr.) with an accuracy of $\pm$0.00003-inch for the pins and $\pm$0.00005-inch for the holes are given in the accompanying table.

Each pin was immersed in a bath of acetone containing solid carbon dioxide until it attained temperature equilibrium with the bath, at —80 degrees Cent. (—112 degrees Fahr.). The reduction in diameter of the pins was calculated for a decrease in temperature of 100 degrees Cent. (180 degrees Fahr.) on the basis of temperature coefficients of expansion of 0.000018-inch per inch per degree Cent. (0.000010-inch per inch per degree Fahr.) for brass, and 0.000011-inch per inch per degree Cent. (0.000006-inch per inch per degree Fahr.) for steel. These are average values at room temperature, considered to be sufficiently accurate for the purpose, and the very slight decrease for lower temperatures was not taken into account.

The brass ring was slipped on the cooled brass pin without difficulty. A film of acetone probably adhered to the pin and may have acted as a lubricant and aided quick assembly. The contraction in the steel pin was not sufficient to permit its insertion into the steel ring, and the latter was heated in boiling water to obtain sufficient clearance for easy assembly. This was also found necessary in order to slip a steel ring on the cooled brass pin.

After the assembled unit had come to room temperature, the ring was pulled from the pin in a hydraulic type of tension testing machine. Automatically recorded load-slip diagrams are reproduced in Figs. 2, 3, and 4. The appearance of the units after the rings were separated from the pins is shown in Fig. 1.

Expansion Joints Hold Tightly

The brass ring on the brass pin supported a load of 2200 pounds (722 pounds per square inch of contact area) before initial slip occurred. The load necessary to continue slippage then increased rather rapidly with slip taking place in small increments until a maximum of 4370 pounds was reached (1430 pounds per square inch of contact area). Continued slip in small increments then proceeded at decreasing loads until the ring cleared the end of the pin.

The appearance of the pin after removal of the ring, Fig. 1, indicated that no appreciable amount of visible seizing had taken place. Most of the increase in load after initial slip was probably absorbed in causing elastic deformation in pin and ring as the ring was forced over the

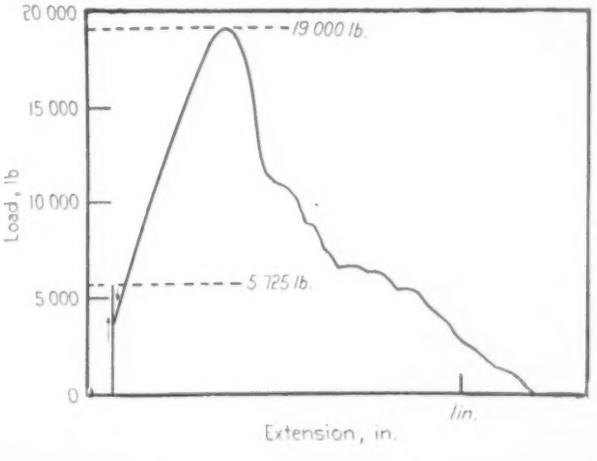


FIG. 4.—Load-slip diagram of a steel ring pulled from a steel pin

protruding end of the pin. No relative change in dimensions was found after the two had been separated. The loading mechanism of the testing machine was such that when a small amount of slip occurred the load immediately decreased until slip halted, which was approximately at the load at which initial slip took place. This is believed to account for the broad band of load fluctuation shown in Fig. 2.

The steel ring on the brass pin supported a load of 5400 pounds (1700 pounds per square inch of contact area) when initial slip took place. The load immediately decreased. Slip then continued in increments somewhat smaller than in the all-brass assembly and at increasing loads until a maximum of 6800 pounds was reached (2100 pounds per square inch of contact area). The band of load fluctuation on the load-slip diagram, Fig. 3, was somewhat similar to that obtained with the all-brass unit. The diagrams, as reproduced in Figs. 2 and 3, do not show all of the lines drawn by the automatic load recording device but show the maxima and minima of the load fluctuations.

The brass pin was distinctly scored by the steel ring as is shown in Fig. 1. Evidently seizing had taken place to a greater extent between the steel and brass than between the brass ring and pin. This seizing was probably responsible for the greater holding power of the steel ring on the brass pin, although the slightly larger amount of oversize of the pin with respect to the ring may also have contributed somewhat.

Tests of Steel on Steel

The steel ring on the steel pin did not slip initially until a load of 5725 pounds was applied (1820 pounds per square inch of contact area). As in the two previous cases, the load immediately decreased but then increased rapidly, without any slip by increments and resultant intermediate decreases in load, until a maximum of 19,000 pounds was reached (6050 pounds per square inch of contact area).

Severe seizing had taken place between the ring and pin as is shown in Fig. 1. Portions of metal had been torn bodily from the pin where the adhesive force between the contact surfaces of pin and ring exceeded the cohesive strength of the steel. The forces necessary to rupture the metal were evidently so far in excess of those required to cause slip on the contact area where seizing had not occurred, that the load-slip diagram obtained, Fig. 4, was essentially similar in form to a load-extension diagram obtained normally in rupturing a tension test specimen of a ductile metal.

The experiments indicate that in shrink fits made by refrigerating the inner member, seizing does not occur until relative motion has taken place between the two contacting surfaces. The force necessary to cause initial slip is probably largely dependent upon the amount of "oversize" of the inner member. After seizing has occurred, the force necessary to continue the separation of the fitted parts is very much increased.

It is believed that the difference in behavior of the brass and the steel assemblies is characteristic of these two classes of materials in general. The failure of the brass to seize is undoubtedly to be associated with the particles of metallic lead disseminated throughout the alloy whereas the presence of the brittle sulphide particles in the steel is responsible, at least in part, for the tendency of the steel to score the brass.

A. S. M. Schedules Technical Papers For Metal Congress in New York

APPROXIMATELY 40 technical papers have been scheduled by the American Society for Metals for presentation at its sixteenth National Metal congress to be held in New York, Oct. 1-5. Of this number, 30 will be preprinted and ready for distribution about Sept. 1.

The papers, covering a wide range of subjects, will be presented at nine technical sessions. One of the features of the program will be a symposium on grain-size in steel, for which nearly a dozen papers have been arranged. The annual meeting of the society will be held on Wednesday morning, Oct. 3.

Headquarters for the American Society for Metals will be maintained at Hotel Pennsylvania. The National Metal exposition, to be held simultaneously with the congress, will be housed in the Port of Authority building. At present, 130 companies have engaged space, giving definite assurance that the show will be the largest for several years. Floor space required already is 25 per cent in excess of that used last year.

Co-operating with the American Society for Metals and conducting technical meetings during the congress are the American Welding society, American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, and the Wire association. The program of the Wire association is presented on page 27 of this issue of STEEL.

Papers scheduled by the American Society for Metals are as follows:

"Effect of High Hydrostatic Pressures on Aging," by L. R. Van Wert, Harvard university, Cambridge, Mass.

"Alloys of Iron and Manganese, Part XIII," by F. M. Walters and Cyril Wells, Carnegie Institute of Technology, Pittsburgh.

"Oxidation of a Low-Carbon Steel in the Temperature Range 1650-2100 Degrees, Fahr.," by Clair Upthegrove and C. E. Siebert, University of Michigan, Ann Arbor, Mich.

"Malleable Castings," by Albert Sauveur and H. L. Anthony, Harvard university, Cambridge, Mass.

"Cutting Temperatures Developed by Single-Point Turning Tools," by O. W. Boston and W. W. Gilbert, University of Michigan, Ann Arbor, Mich.

"Properties of Some Cast Alloy Steels," by T. N. Armstrong, Norfolk Navy Yard, Portsmouth, Va.

"Physical Properties of Case Hardened Steels," by O. W. McMullan, Timken-Detroit Axle Co., Detroit

"Prolonged Tempering at 100 Degrees Cent. and Aging at Room Temperature of 0.8 Per Cent Carbon Steel," by G. A. Ellinger and R. L. Sanford, national bureau of standards, Washington

"Influence of Nonmetallic Inclusions Upon the Precipitation of Primary Cementite in Hypereutectoid Steels," by E. G. Mahin and E. F. Lee, University of Notre Dame, Notre Dame, Ind.

"Grain Size in Relation to Machinability," by H. W. Graham, Jones & Laughlin Steel Corp., Pittsburgh

"Influence of Grain Size on Magnetic Properties of Steel," by W. E. Ruder, General Electric Co., Schenectady, N. Y.

"Importance of Grain Size in Sheet Steel for Deep Drawing," by R. L. Kenyon, American Rolling Mill Co., Middletown, O.

"Factors Determining the Impact Resistance of Hardened Carbon Steels," by Howard Scott, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Grain Size Control of Open-Hearth Carbon Steels," by S. Epstein, J. H. Nead and T. W. Washburn, Battelle Memorial institute, Columbus, O.

"Influence of Grain Size on the High-Temperature Characteristics of Ferrous and Nonferrous Alloys," by A. E. White and C. L. Clark, University of Michigan, Ann Arbor, Mich.

"Effects of McQuaid-Ehn Size on the Hardness and Toughness of Automotive Steels," by H. W. McQuaid, Republic Steel Corp., Detroit

"Effect of McQuaid-Ehn Grain Size of Steel in Forgings," by W. E. Sanders, Buick Motor Car Co., Flint, Mich.

"General Relations Between Grain Size and Hardenability and the Normality of Steels," by E. S. Davenport and E. C. Bain, United States Steel Corp., Kearny, N. J.

"Effect of Deoxidation on Some Properties of Steel," by C. H. Herty Jr., Carnegie Institute of Technology, Pittsburgh

"Studies in the Metallurgy of Arc De-

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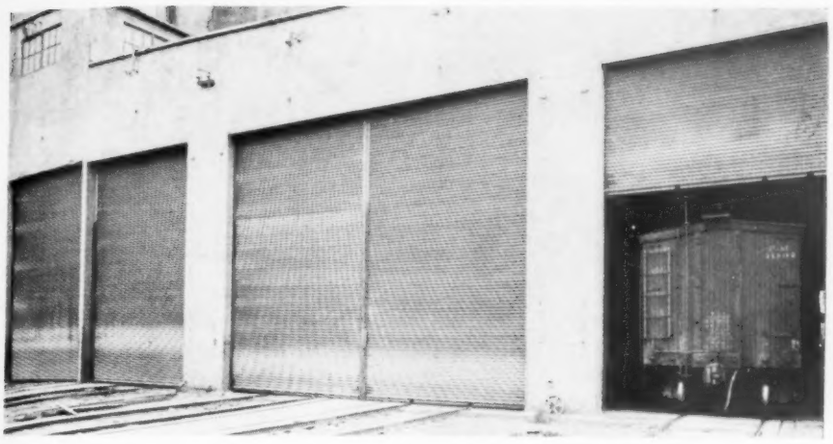


—Photo courtesy Kinnear Mfg. Co., Columbus, O.

Typical application of rolling steel doors in a grain elevator. Manufacture of this type of door accounts for about 5000 tons of steel annually

LARGE USES OF STEEL IN SMALL WAYS

266th Article ◆ Rolling Doors

STEEL doors have found wide application in various structures where strength as well as protection against the fire hazard are important considerations. While solid steel or combination wood and steel construction frequently meets requirements for smaller doors, the rolling type offers the advantage of space-saving compactness and, in addition, solves the problem of a closure for large openings in buildings. Easy to operate, rolling door installations are not limited by the size of the area to be closed and provide effective guard against fire and intrusion. Practically the entire side of a building can be converted into the equivalent of a single opening by one or a series of doors.

Principal parts of a typical rolling door include: The curtain; the barrel around which the curtain winds when raised; the helical springs enclosed in the barrel in order to provide counterbalance; and a crank, chain or motor drive for operating the door, although small sizes can be opened and closed by hand. While doors may be made from various materials, steel is employed principally, with cast iron used for some parts and representing about 15 per cent of the total weight of a steel door installation. During recent years the industry has accounted for the consumption of around 5000 tons of steel annually in the manufacture of this equipment.

The curtain is made up of a number of curved, interlocking slats fabricated from steel strip ranging from 22 to 16 gage in thickness. One manufacturer uses copper bearing steel for the slats, forming them from the coiled strip by means of a rolling operation. The sections are hot-galvanized, assembled and secured in place by malleable iron endlocks. Two steel angles placed back to back comprise the bottom bar of the curtain.

Hood Encloses Barrel

The steel barrel, about which the curtain coils when raised, is journalled in cast iron brackets, while the curtain travels in structural steel guides mounted at the sides of the opening. A hood, made of 22 or 24-gage steel, is placed around the barrel and coil, with the door mounted either on the face of the wall or in the opening.

Rolling doors are built in sizes to accommodate the individual installation and are not made to standard dimensions. Doors may be built as small as 3 feet wide and 6 feet high, while the largest ones erected recently are 42 feet wide and 14 feet high. Four of the latter size, weight 7½ tons each, have been installed in the new Chicago postoffice. Illustrated is a typical application of rolling doors in a grain elevator.

Doors described above are known as the service type to distinguish them from fire doors. Fire doors are similar in construction except that they are thermally controlled in their operation by means of a fusible link. Other minor features are incorporatedy to increase their fire protective value, such as provisions to allow expansion of the steel under extreme heat. An auxiliary spring located in the spring barrel is inoperative during normal operation but is released by action of the link in the event of fire. This equipment finds use in vertical shafts, corridors, fire walls and room partitions as well as in openings in exterior walls.

Fire shutters follow the principal design features of fire doors, but are for installation on exterior window openings and are intended to operate only in the event of fire. Normally in an open position, the shutter closes upon the parting of the fusible link, being driven closed by means of a push-down spring. Experience has proved that these steel shutters are invaluable in preventing the spread of conflagrations.

World Tin Consumption Shows 27 Per Cent Increase

A 27 per cent increase in world consumption of tin for the year ended May, 1934, compared with the previous twelve months, is shown in the current bulletin of the Hague statistical office of the International Tin Research and Development council. Tin consumption during the year ended May, 1934, amounted to approximately 129,600 long tons as compared with 101,765 tons during the year ended May, 1933.

Comparative consumption of tin by various countries is shown in the following table:

	Long tons, 12 months, ended May, 1933	1934	Increase per cent
United States	38,470	58,117	51.1
United Kingdom	17,879	20,112	12.5
Germany	8,872	11,007	24.1
France	9,826	9,554	—2.8
Italy	3,753	4,020	7.1
U. S. S. R.	2,676	5,153	92.5
British India	2,051	1,900	—7.4

Tin consumption in the tin plate industry during the year ended May, 1934, is shown as 55,000 tons, this being 5000 tons more than in 1929 and 2800 tons more than in the peak year of 1933.

World automobile output during the first five months of this year, the bulletin states, amounted to approximately 1,835,030 units as compared with 1,076,282 units during 1933. Tin consumed in this industry during the same period totaled 5700 tons in 1934 as compared with 3590 tons in 1933.

During the year ended May, 1934, babbitt metal consumption increased approximately 64 per cent as compared with the previous year.

Silicon Structural Steel Is Used to Cut Bridge Weight

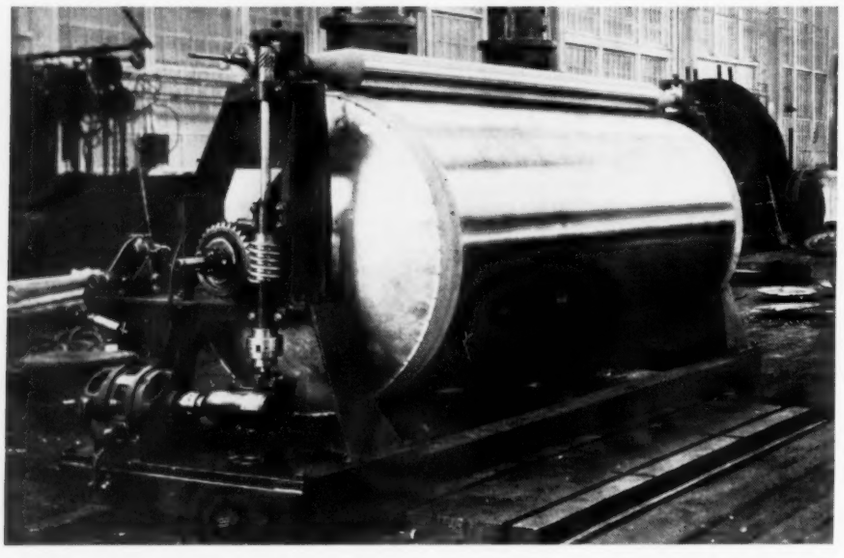
Reducing weight approximately 20 per cent, the span of the largest vertical lift bridge in the world, to cross the Cape Cod Canal, Buzzards Bay, Mass., will contain several hundred more tons of silicon structural steel than carbon steel. Excluding a few auxiliary equipment units on the span, specifications call for 2300 tons of silicon steel and 1800 tons of carbon steel. There has been a steady tendency toward greater use of silicon steel in bridges to save weight, but, strangely, the first large bridge in which silicon steel was used contained a larger proportion of this material than the Cape Cod bridge. This was the 6500-ton bridge crossing the Thames river at New London, Conn., a New York, New Haven & Hartford railroad structure fabricated and erected by the American Bridge Co. more than 15 years ago.

$ $ $

Lumber Charred by Means Of Oxyacetylene Torch

In Australia telegraph poles sometimes are charred with an oxyacetylene flame to provide resistance against decay; in the United States it frequently becomes desirable to char lumber for ornamental purposes, a procedure which brings the grain into relief. A customer of a southern lumber company accomplishes this operation satisfactorily with a machine welding torch equipped with a water-cooled welding tip. In production, it is possible to char between 3000 and 4500 lineal feet of lumber, 12 inches wide and 1 inch thick, per hour. Action of the flame is so timed that the softer portions of the board surfaces become blackened and the harder spots are negligibly affected. The resulting color contrast produces a pleasing design. Commercial development of the process has been held up by the depression in the lumber business.

$ $ $



ROTARY DRUM DRYER BUILT OF ARC WELDED STAINLESS STEEL AND ALUMINUM: This unusual rotary steam drum dryer was recently completed by the Struthers Wells Co., Warren, Pa., for a large food manufacturer. It is 5 feet in diameter and 10 feet long and is built to withstand a working pressure of 100 pounds per square inch. The heads are of high-carbon steel insulated and lagged with polished aluminum sheets. The surfaces of the stainless steel main shell and top roll were machined and polished with a tolerance of 0.0005-inch. Welding was done throughout with equipment manufactured by the Lincoln Electric Co., Cleveland

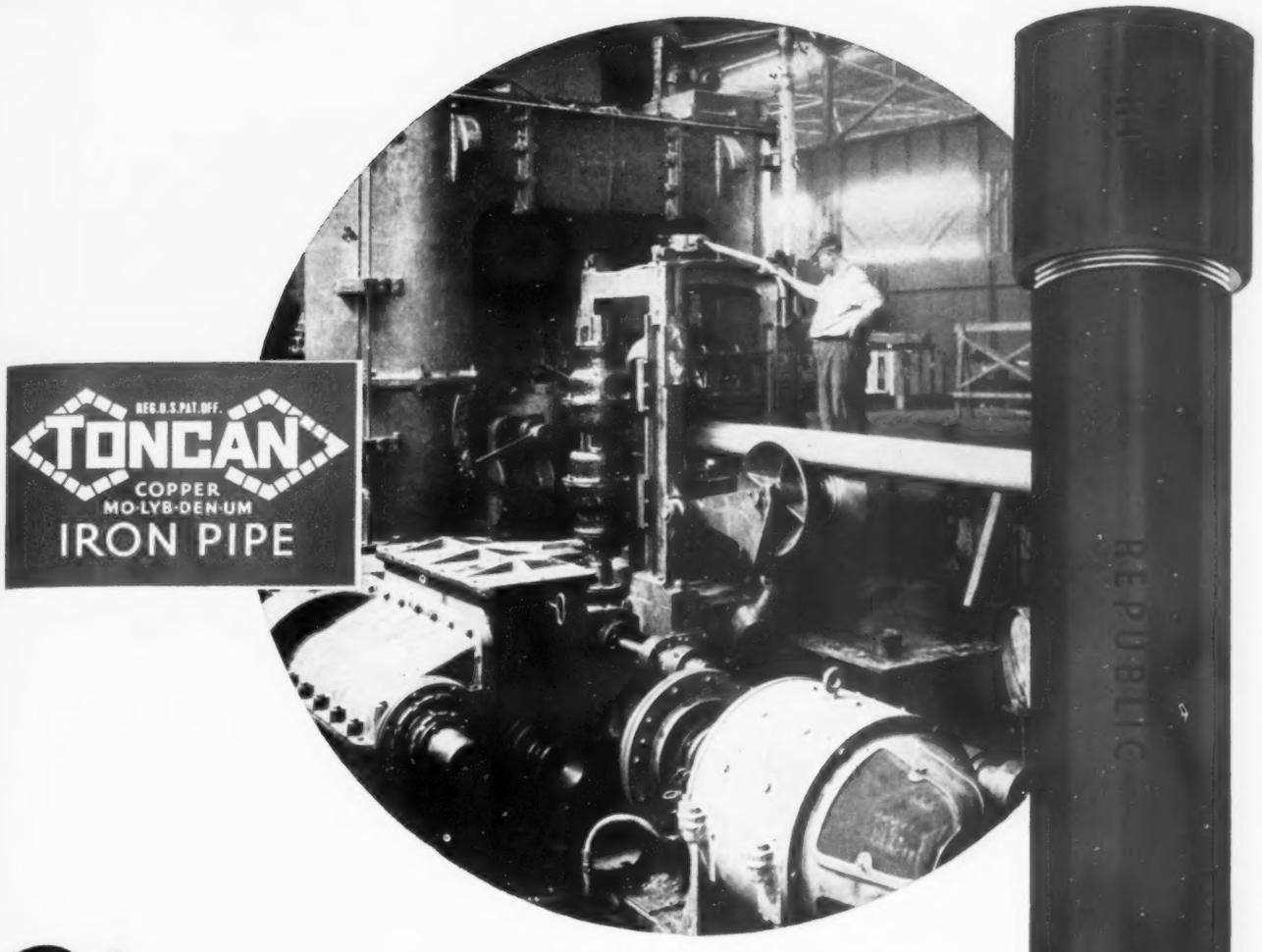
Tin Plate Coating Contains Small Amount of Lead

Several producers of tin plate have been experimenting recently with production of a light-gage plate with a coating containing an extremely small percentage of lead. This material, specified as 1-pound terne plate, is being used by several leading oil companies for quart oil containers. Development of the 1-pound terne plate has come from competition by several tin plate producers in making a copper-coated tin plate. The latter process involves installation of costly electrolytic equipment, but the production of a light terne, such as the 1-pound stock, is said to be less costly and equally as satisfactory from the standpoint of results obtained.

$ $ $

Clad Steel for Bleach Tank

Stainless-clad steel was used in making a 20,000-pound capacity bleach tank for a soap manufacturer. The tank, just completed, is 6 feet in diameter and 13 feet long. It has a water-jacketed conical bottom. Material ¼-inch thick was used for the shell and the bottom and ⅜-inch



Now electric welded

Every user of Toncan Iron Pipe knows that its corrosion-resisting qualities make it a real value. But not every user is familiar with the plus value that Republic's Patented Electric Resistance Welding Process brings to this longer-lasting pipe. Yet Toncan Iron Pipe is the only pipe on the market today that combines the qualities of rust-resisting iron with the mechanical perfection of a pipe made by this modern process.

This is the story in a few words. Toncan Iron is refined in the open hearth furnace and alloyed with copper and molybdenum to increase its resistance against rust. The ingots are rolled into strip. The strip is cold formed to a round, and the seam is then welded under pressure by electrical resistance without the addition of foreign metal at the weld. The result is pipe that is straight, uniform in wall thickness, perfectly round, clean of scale inside and outside, free from surface and hidden defects, and with a weld about which there can be no question.

Add up these qualities. Compare the service given by Toncan Iron Pipe with that given by pipe only slightly lower in first cost, and its economy will tell you to specify it wherever corrosion is a factor.

Write for a copy of the third edition of "Pipe for Permanence."

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

material for the water jacket. All welds were ground smooth on the interior and stainless fittings were used throughout. It will be used for refining glycerin.

\$ \$ \$

The stabilizing effect which chromium exerts on carbides is especially useful in resisting growth in cast iron after repeated heatings. In general, certain investigators have found that 1.50 per cent chromium retards volume changes up to 1600 degrees Fahr. and therefore is used for annealing pots, ingot molds, grate bars, and the like.

\$ \$ \$

Malleable cast iron containing over 2 per cent carbon, 1 per cent aluminum and 1 per cent chromium may be nitrided to produce a case 1/32-inch thick in 40 hours at 975 degrees Fahr., according to a recent patent. The composition range covered is 0.90 to 2.83 per cent silicon, 0.4 per cent molybdenum, 1.5 per cent chromium, 1 to 2 per cent aluminum and over 2 per cent carbon.

\$ \$ \$

Because of their strength, resistance to wear and abrasion, and immunity to rust, monel metal airplane skis are used for winter flying by foresters of the Ontario department of lands and forests.

\$ \$ \$

All but one English railroad have standardized on monel metal staybolts for locomotives. It is estimated that during 1934 approximately 50 tons of this metal will be used for this purpose in England. These bolts support the firebox plates and must be made of a material having high fatigue resistance at elevated temperatures.

4000-Pound Drop Hammer Installed at Fair To Forge Steering Knuckles

COMMEMORATING the 100th anniversary of the invention of the steam forging hammer and signalizing its importance in the automotive industry, the Chrysler Corp. has installed at its exhibition building in *A Century of Progress*, Chicago, a 4000-pound steam drop forge hammer, in operation every day forging steering knuckles for Plymouth cars. Weighing over 60 tons, the hammer is one of three units in this forging exhibit, others including geared trimming press and heating furnace.

The furnace is gas heated and supplies alloy steel billets to the hammer at a temperature of 2210 degrees Fahr. The billets are 3 x 6 x 1½ inches in size and are forged at the rate of one per minute. After the billet is heated it is placed on the bottom die of the hammer where four operations take place—drawing out, upsetting, shaping and finishing. The forging is then transferred to the trimming press where the flash is scaled off while it is still hot. An accompanying illustration shows the appearance of the finished forging. The finished product is then shipped to Detroit for heat treatment, machining and assembly.

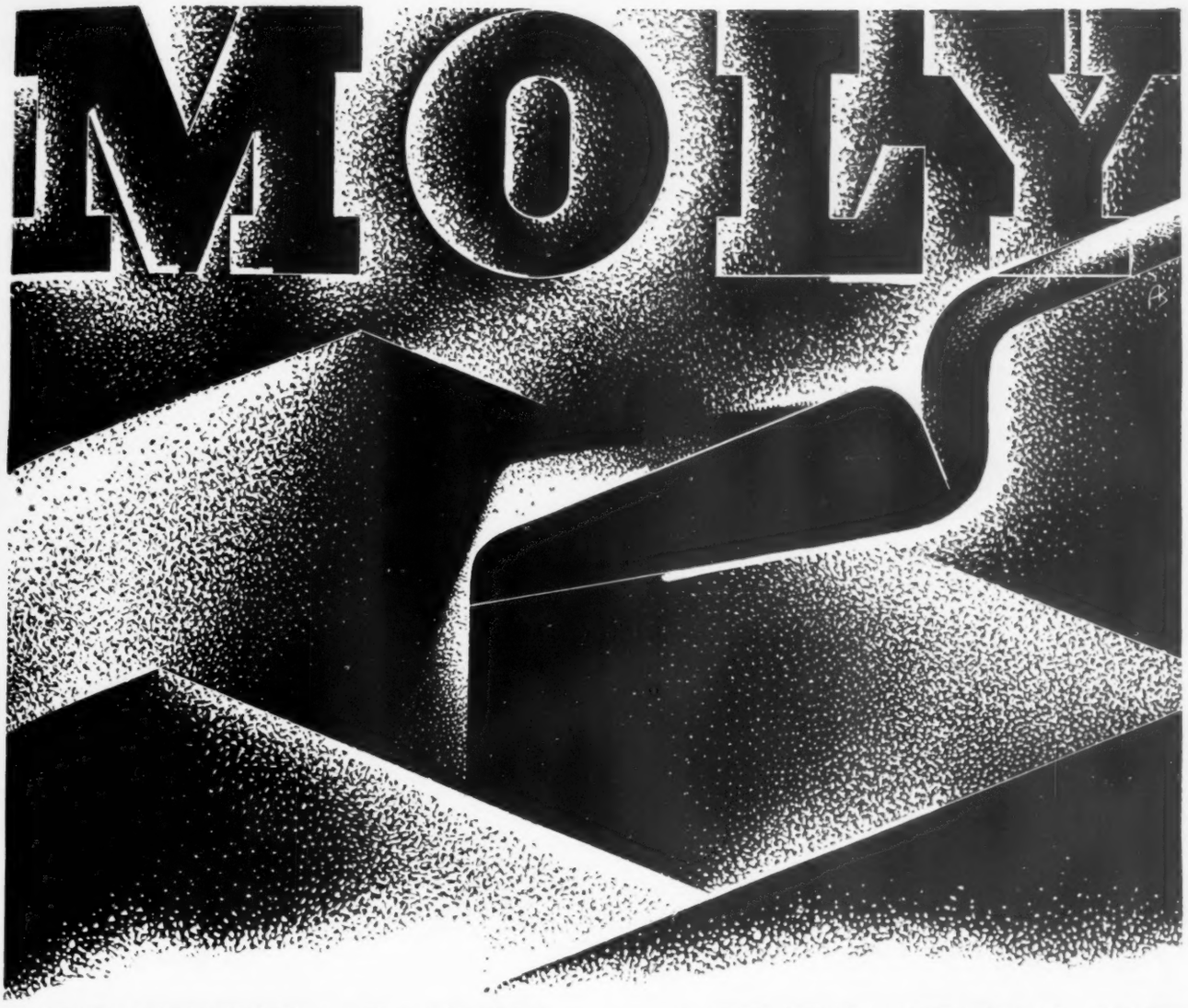
Automobile front wheel spindle and steering knuckle, forged from 3 x 6 x 1½-inch alloy steel billet; weight 6½ pounds

Said to be the largest piece of equipment at the fair, the hammer is provided with a 40-ton one-piece cast steel anvil block which required two days' work for moving from railroad car to foundation. The hammer, shown herewith, is of standard design, built by the Erie Foundry Co., Erie, Pa., and known as type G. Cast steel frames are of box section. Ram guides are of forged steel and are adjustable but are so designed that they are surrounded by the frame on four sides and have no vertical movement. Ram and sow block are of forged steel, supplied by the Heppenstall Co., Pittsburgh. Piston rod, integral with the piston, is forged from chrome-vanadium-molybdenum steel. The hammer is operated on compressed air, as a matter of convenience for the exhibit.

From a technical standpoint, interest centers in the design of the dies. Spindles usually are forged with the center line of the spindle lying in the parting line between the top and bottom dies. This, however, necessitates draft on the flange, on the wide face between the two bosses. The draft must be removed by a separate forging operation in an upsetter or press, or else it must be machined off.

In the present case, the dies are made with the parting line running

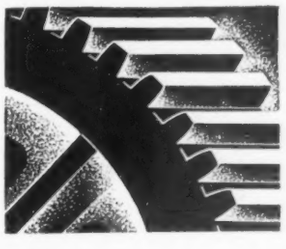
A 4000-pound steam drop hammer and (in background) geared trimming press, producing front wheel spindle forgings at the World's fair



LIKE CEMENT IN SAND . . . A LITTLE DOES A LOT

ONE of the great advantages of the use of Molybdenum is in the fact that a small amount of this versatile alloy does a great deal of work.

In cast iron, for instance: An interesting example is that of a 3000-pound cast-iron gear, the teeth of which had to be hobbed from the original casting. Previous to the application of "Moly," a total of 84 pounds of alloy had to be added to the iron to produce a suitable mix for this purpose. By using Molybdenum, the total alloy addition was dropped to 27 pounds, the alloy cost reduced considerably and the resultant product had a better finish, greater strength, toughness and wear resistance.



In *any* iron, or steel, "Moly" can be depended on to enhance the desirable qualities. Easier machinability, without loss of hardness or toughness, stronger welds, greater corrosion resistance may be added to those already mentioned. And invariably the improvement is worth far more than the cost of the small quantity of Molybdenum required.

"The Moly Matrix" is a new house organ designed to help executives and engineers to keep up to date with the new developments in Molybdenum metals. A post-card request will put you on our mailing list. And our metallurgists and modern laboratory facilities in Detroit are ever available to aid in your alloy experiments or problems. Write also for these interesting new books: *"Molybdenum in* 1934" and *"Molybdenum in Cast Iron*—1934 *Supplement."*

CLIMAX MOLYBDENUM COMPANY, 295 MADISON AVENUE, NEW YORK

CLIMAX Mo-lyb-den-um

around the edge of the flange so that the dies are interlocked, and the forging is gated at one edge of the flange. This would involve nothing unusual if it were not for the fact that in order to provide the necessary "toe-in" to the wheels, the center line of the spindle is not at right angles to the center line drawn through the two bosses. In other words when draft is provided on the adjacent faces of the bosses the center line of the spindle is not vertical but instead extends into the die at an angle.

Detail of the forging operation is as follows: A taper is drawn out at one end of the blank; this drawn out tapered part is then placed almost vertically in another impression in the bottom die and the section at the other end of the blank is flattened out and in subsequent operations forged to the desired shape. During these operations the forging remains in the bottom die, while the top die leaves the forging at each stroke, the usual draft being provided on the ends of the bosses. The forging having been finished, it is removed from the bottom die, not vertically but at a slight angle corresponding to the "toe-in" angle of the spindle.

Steel Anchor Chain for New British Liner Is Electrically Welded

BY CAPT. J. G. BISSET

THE world's greatest and fastest liner, until now known by her job number of 534, is to be launched on Sept. 26 by Her Majesty the Queen, and will be named BRITANNIA.

Unlike the three giant liners LEVIATHAN, MAJESTIC and BERENGARIA, which carry a stem, or center anchor weighing 14 tons and two bower anchors weighing 8½ tons each, the BRITANNIA will carry only two bower anchors weighing 16 tons each. The main reason for this is that the stem of the BRITANNIA will be of full, rounded form so that should the cable lead across the stem, it will not be subjected to any more of a nip than it would when leading aft from a well designed hawse-pipe.

In the three ships mentioned, the stems are sharp and center hawse-pipes are necessary. This meant that the stem anchor was in constant use while the bower anchors were looked upon merely as supplementary equipment.

The 16-ton anchors of the BRITANNIA will each have 165 fathoms of cable attached. These cables are being manufactured by Samuel Taylor & Sons Ltd., Brierley Hill, Staffordshire, England, under a special process known as "Tayco."

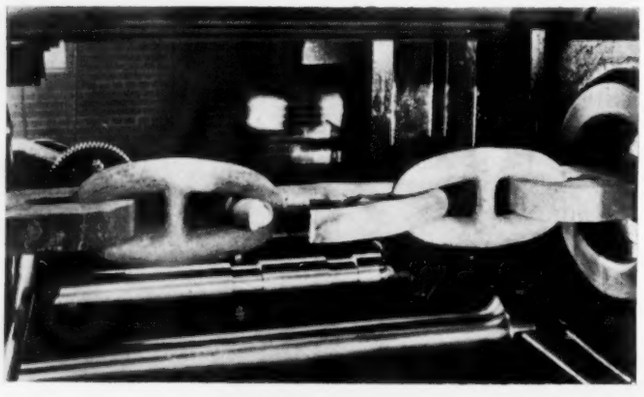
They are made of 31 to 35 tons tensile steel and will have a total weight of 145 tons. The links are 4⅛ inches in diameter, and each cable will be tested to a tensile strain of 289.4 tons. In addition to this, a three link piece will be taken from each 15-fathom length and tested to the breaking strain of 405.1 tons. The raw material, Siemens-Martin steel, for each link takes the form of two forgings, and these together form one link, with a stud which is an integral portion of the link.

Joint in Link Stud

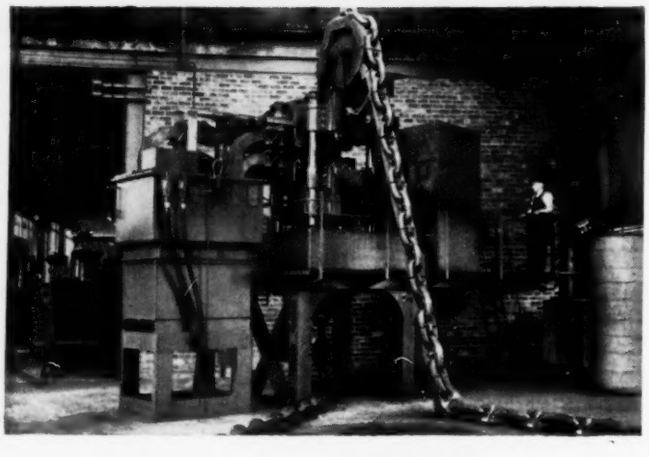
The links are made with a joint across the middle of the stud, and are forged with this joint sufficiently open for threading. After threading, the joint is closed and the two flat faces thus formed are welded together in an electric forge. Each link can be bent double when cold, without showing any traces of fracture.

One of the illustrations shows a three-link piece being subjected to a destruction test, and some idea of the perfection to which electric welding has been brought, is attained from the fact that the cable fractured under a 693.4 tons load, and not in the weld, but in the original solid material.

Lloyd's tensile strain for 4⅛-inch diameter hand welded chain cable made from iron, is 206.7 tons, and the breaking strain on a three link sample piece is 289.4 tons.



DESTRUCTION test on 4⅛-inch diameter stud link chain cable. Fracture occurred at a load of 693.4 tons. The links are from a chain similar to that for the new liner BRITANNIA



STUD link chain cable of 3-inch diameter going through the welding machine at Samuel Taylor & Sons Ltd., England. When tested to destruction, this chain broke at a load of 372.9 tons

Alloy-Lined Fittings Show Long Life in Refineries

Arc welded, alloy-lined fittings in high-pressure cracking apparatus have given high corrosion resistance and long life in oil refineries. In one instance, fittings which had been in service approximately 22 months showed a saving of 59 per cent of the cost of old-style fittings. Such pipe line joints usually are made with carbon steel flanges, valves, crosses, etc. Due to the corrosive action of "sour" crude oil the life of these fittings is as low as six months and few last over a year. The lined fittings have an indefinite life and are much less expensive than solid alloy fittings.

THAT REMINDS YOU!

WHAT do you see in this picture? Ships, cars, stacks, a hundred vital needs of modern civilization—all made of steel. Doesn't it remind you of the importance steel plays in your own fabricating work?

If you use sheets or plates in regular or copper bearing grades may we remind you that Granite City Steel Company offers you unusual service. For Granite City Steel is really "tailor-made" (for quantity orders) exactly as indicated on your specifications—made for you from "heat to sheet."

For "tailor-made" steel specify Granite City Steel. Made at Granite City, Illinois, only 15 minutes from St. Louis, served by 29 railroads and the Mississippi River—better service to the Mississippi Valley, the West and the Southwest.

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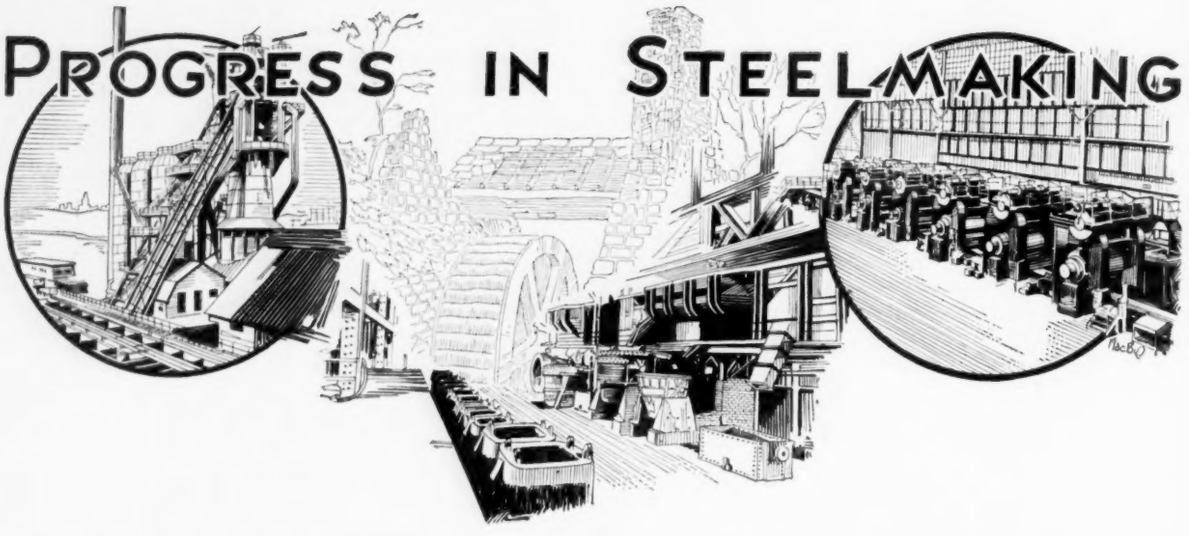
PROGRESS IN STEELMAKING



TESTS recently conducted at a tin mill abroad disclose that on a tin pot containing 4½ tons of tin and 1½ tons of palm oil raised to 600 degrees Fahr. and 470 degrees Fahr. respectively, the thermal efficiencies obtained were 25 per cent for coal, 32 per cent for producer gas, and 54 per cent for artificial gas. The average spread throughout the day between the temperature of the tin bath on either side of the pot is interesting. This, with producer gas, was 74 degrees Fahr., with coal 50 degrees, and with artificial gas only 4 degrees. The average variation in the tin coating over the area of a plate coming from the tin pot when fired with coal was 0.51-pound per base box, while that from gas-fired pots was only 0.12-pound per base box, and the average saving of tin per box was 1 ounce. Not considering the saving on scruff formation the saving effected by pots fired with artificial gas was 47 per cent.

♦ ♦ ♦

Cleaning greasy, dirty surfaces, such as window panes, machinery and other hard surfaces at blast furnace and steelworks is accomplished rapidly by a newly marketed product which contains an active vegetable solvent. The cleaner merely is streaked across the surface and then wiped clean with a damp cloth.

♦ ♦ ♦

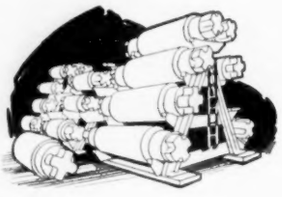
Pipe and pipe couplings for deep well drilling now are being manufactured with matched threads by an Ohio producer. Specially designed milling cutters are employed. In milling the threads on the pipe and in the couplings, the same master tool is used for making the tools for threading the pipe and couplings. The inherent characteristics of the master tool, therefore, are reproduced on the cutting tools and passed on to the threads on the pipe and couplings. The result is matched threads which show no sign of weakening at depths of 2½ miles.

♦ ♦ ♦

About 600 heats is the life to be expected of copper mold stools based on stool costs. The life of cast-iron ingot molds is greatly prolonged when used in conjunction with a copper stool.

♦ ♦ ♦

Results demonstrate that sheet and strip mill rolls are more effective when rotated in the same direction during their operating life. Reversing the direction frequently results in surface roughness, particularly when the rolls are not dressed with a collar. By dressing one roll with a collar on each end about 1¼ to 1½ inches wide (the height varying with the length of the roll body), however, the two rolls are kept apart and thus prevented from grinding together when running idle.



♦ ♦ ♦

Reclosing steel mill breakers one, two or three consecutive times, with equal time intervals between reclosures, when the breaker is tripped by overload is the purpose of a newly developed device for use with oil circuit breakers. If the overload disappears after any reclosure, the attachment will return to its normal position and the breaker will remain closed. Should the overload still exist after the last reclosure, the breaker will remain locked open and it will be necessary to close it manually before any further automatic operation occurs.

♦ ♦ ♦

So reliable is the photronic system for controlling the descaling of hot strip at an Eastern plant that all manually-operated water valves and pipes leading to them have been eliminated. When the hot steel passes within the range of the photoelectric cell, a thrustor operates a hydraulic valve, pressure water being discharged against the surface of the steel but only when the strip is in the desired position for spraying.

♦ ♦ ♦

Blast furnace mixer valves, steel mill dampers and monitor sash now may be actuated by a redesigned operating mechanism which is built with self-contained reduction gears and mechanical and electrical limit devices. The valve operating nut that opens and closes the valve disk is supported by antifriction bearings. Reduction of motor speed of 1800 revolutions a minute is effected by a low-ratio helical gear and a steel worm and bronze worm gear.

♦ ♦ ♦

Novel facilities are used at an open-hearth shop in the East for cleaning ingot molds. A monorail crane built with ball bearing wheels to facilitate its movement by hand along the row of molds and supporting a railed-in platform is employed. Workmen stationed on the platform move the crane from mold to mold cleaning the interior surface with a wire brush having a chisel on one end, as they progress. Beams from two electric lights mounted on the crane are reflected on the interior of the mold.

Lake Iron Ore Industry Threatened by Taxation and St. Lawrence Waterway

(*Continued from Page* 20)

iron mines to meet an accelerating future demand for more than 25 or 30 years after making allowance for additions to the reserve by discovery and development. But no informed person is thinking in such terms today. Most of us believe that the period of acceleration in shipments is over. But that is not important. We have a new outlook. We now know that high-grade iron ore can be made from low-grade iron bearing material, of kinds not until recently considered amenable to treatment, in quantities so enormous that estimates are found to have no meaning whatever.

We know further that this high-grade ore so made can be delivered to any furnace now using lake ores at a cost which will permit its use there provided that the cost for taxes and royalty is nominal and that the natural geographic advantage of the Lake Superior mines be not destroyed by free passage of ocean freighters into lake ports.

Held Economically Feasible

High-grade ores so made are, of course, not available at the present cost of production of "direct shipping" and "wash" ores, but there is plenty of room between the existing delivered price of lake ores at furnaces now tributary to them and the delivered cost of sea-borne ores at those furnaces to permit it to be done. If the present value of lake ores were $1 to $1.50 higher it would be feasible to deliver foreign ore, as for instance from Brazil, to interior points such as Youngstown. But below those values it would be possible to supply interior furnaces with the concentrated ores to which I have referred.

I say to "permit it to be done" because the present policies of Minnesota and the United States apparently are not formulated with any such possibility in mind. Through extraordinary taxation to get "all the traffic will bear" and threatened confiscation of mining property Minnesota encourages the furnaces to look elsewhere for ore supplies for the long future and the United States proposes to accommodate them by making seaports of Great Lakes harbors. At the present rate of taxation the people of Minnesota would collect about $1,000,000,000 on the remaining reserve of "direct shipping" and "wash ores," the United States in the meanwhile spending $1,000,000,000 or more to bring ocean freighters into the Great Lakes on terms now enjoyed by them in our Atlantic ports.

Our lower lake market would then disappear just as the eastern market has already disappeared. We couldn't meet the price of the foreign ore without making peons of our miners which is not to be thought of and in any event cannot be done in this country.

It is now proposed to build and maintain free deep passage for ocean freighters quite to the ore docks of the Lakes; to open the interior markets to cheap foreign ore, borne by foreign vessels paying half the wages paid on lake ore carriers and mined by labor in foreign countries which is paid less than half the wages of Lake Superior miners. Inconsistent with that proposal, the government expects the ore carriers and the mine operators to pay high and higher wages to labor that it may consume more and more goods on a rising scale of prices which it seeks to bring about.

I do not have the opportunity to analyze all of the economic aspects of the proposed Lakes-to-Atlantic deep waterway. I will have accomplished

my purpose in alluding to it if I get you to analyze it and make your influence felt against it in the realization that only a favorable vote of the senators of the United States is now necessary to put the whole project under way. That such a proposal could have reached treaty stage with the endorsement of both of the great political parties of this country without a searching analysis of what its effect would be on the economic structure of the Middle West is another evidence of the bewilderment of the collective mind in the shattered postwar world.

I am convinced that the building of that waterway and its operation at public expense would eventually destroy much of the shipping on the lakes as well as the iron mines of Lake Superior and in so doing weaken the industrial strength of the country and its power abroad. I suppose it is not the intention to build this waterway for the purpose merely of getting goods out of the country. The ships that carry goods out will have to bring goods in or they will not be able to operate.

It would make us look foolish abroad, especially in Canada, our proposed partner, to build the canal and then prevent its use by placing prohibitive duties on goods for the interior market. But were the proposal to build it coupled with the promise of a prohibitive tariff on iron ore I would oppose it none the less because I prefer the tangible protection of natural geographic advantage to the fickleness of political promises and policies.

If ocean shipping be confined to our natural sea ports and if the public require from the iron mines of Lake Superior in the future taxes which are in fair relation to those levied on other property and industry, the Lake Superior region will continue for hundreds of years to support the blast furnaces of the Middle West in competition with every other known source of iron ore.

Without any regard to considerations of national security and industrial strength and self-sufficiency, which I consider paramount, the iron mining industry of Lake Superior should be fostered in the interest of the people directly concerned with it and the preservation of the wealth invested in it.

Millions for Wages and Taxes

In 1929 the Lake Superior iron mines paid to more than 22,000 persons directly employed wages and salaries of about $34,500,000 and taxes, other than federal taxes, of more than $26,000,000. There was directly invested in the mines about $300,000,000. There were 161 units in operation making an average shipment per mine of 410,190 tons of iron ore of a market value at Lake Erie ports of about $300,000,000, supporting the operation of 229 blast furnaces in nine states making 80 per cent of the total iron of the United States and 33 per cent of the iron of the world.

This ore was shipped over light upper lake railroads maintaining 1500 miles of track for this service, representing with equipment an investment of about $45,000,000. It was dumped into 20 loading docks at upper lake ports representing an investment of about $70,000,000. There were employed in upper lake rail and dock service about 2400 men to whom were paid wages amounting to about $1,800,000 in the seven months of the shipping season.

From the upper lake loading docks the ore was transferred into vessels of the ore carrying fleet numbering 314, not including some barges and the vessels of Canadian registry, with capacity of 2,754,000 tons of ore per trip on 19 feet draft. This fleet was manned by 11,000 persons

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More Elongation

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Maintain Cold Necks and
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Resurface Rolls Only ¼ as Often
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Save at Least 25% of the Power
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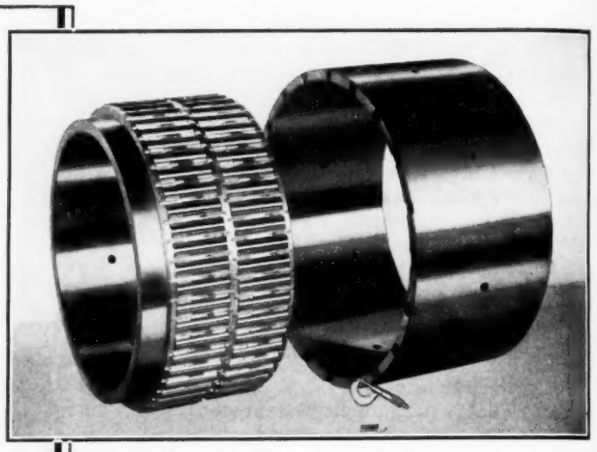

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ONE OR A HUNDRED MILLION • ½" TO 60"

to whom was paid for services about $9,600,000. It represents 58 per cent of the gross commercial tonnage of the Great Lakes and has a replacement value of about $207,000,000. It was served by 53 tugs worth about $3,000,000 employing 425 men to whom was paid for services in seven months about $630,000.

The ore fleet delivered its cargoes to 16 unloading docks at lower lake ports of a replacement value of about $30,000,000 and 20 furnaces having their own unloading facilities. On these docks were 1200 men who received in wages about $1,100,000.

All of these activities, including mining and rail and boat transportation are comprised within the iron ore industry of the Lake Superior region. The value of all of the facilities and properties used in delivering the ore in 1929 was roughly $655,000,000, number of men employed about 37,000, wages paid about $46,630,000.

Keep Going To Provide Jobs

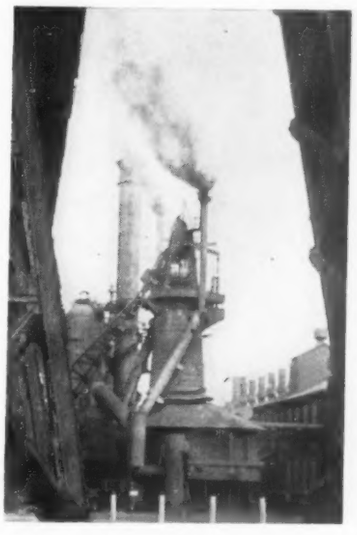
In the fifth year of the depression the transportation and dock facilities are intact but production facilities have been considerably reduced by abandonment of a number of operating properties. A portion of the undeveloped ore reserve has passed from the hands of the ore producers, corporate surpluses are depleted and a few operating companies have gone out of business. The towns and villages of the iron ranges bear some outward evidences of the hard going of recent years, to be expected because the payroll dwindled from the annual thirty and more millions of the 1920's to four or five million in 1932, corresponding to the drop in shipments. The operating companies have done much to alleviate conditions, operating their mines, especially in winter, to the extent of the facilities for storing the ore, dividing the work fairly to employes. In co-operation with relief authorities they have seen to it that the employes and those depending on them have been housed, fed and clothed. Physical distress has been rare and the morale of the employes has been remarkably good. One of the heartening by-products of the depression has been a new realization of the loyalty and staunchness of the organizations at the mines from workmen to superintendents and managers. The other elements of the population of the iron ranges are hardly less dependent on the operation of the mines than the miners themselves and they too have had their good part in the struggle back to better times.

I do not wish to give you the impression that difficulties are behind us on the iron ranges. The operations of this year are no more than half normal. There is very good opinion that they will not return to the tempo of the 20's, that we shall have to adjust ourselves to a new "normal" of yearly shipments considerably under the 50,000,000 tons average of 1910-30. The birth rate is slowing down, immigration is greatly restricted, our "frontiers" have been conquered, the country is in a high stage of development, the remelting of ever accumulating scrap limits the demand for virgin metal, the outlook for exports is complicated and uncertain, substitutes for steel and iron grow more numerous. All of these and other considerations, in the minds of many thoughtful people, have put an end to the acceleration in movement of iron ore from Lake Superior mines if, indeed, they have not reversed the trend for a considerable future period.

What To Do With Surplus Labor?

If that be true a social problem, already of importance in some localities, especially on the Mesabi range, will be accentuated, the problem of surplus unemployed population. Lumbering, once a great industry of the Lake Superior country, is no longer relatively important. Agriculture makes little headway in the areas adjacent to the iron ranges. Exploratory activity, which formerly employed many men, is no longer characteristic of the iron country. The machine has been less important in displacing labor in the mines than in many other industries but it has had its effect. The output per man has doubled in the last 20 years. The production per man employed in 1929 was about 3000 tons.

Roughly, two-thirds of the ore came from open pits mainly on the Mesabi range of Minnesota. About 22,000,000 tons was mined underground mainly on the old ranges by about 12,220 men working throughout the year and producing about six tons per man per day of work; and about 44,000,000 tons was produced from open pits by 7800 men working an average of seven months in the year and producing 32 tons per man per day of work.



—Eugene Hutchinson

The decline of lumbering, the practical completion of exploratory work and the major stripping operations which preceded the present pit mining and greatly improved methods of both pit and underground mining have had much to do with the concentration of surplus populations in the towns and villages of the Mesabi range. Taxation to relieve unemployment was practiced there for many years before the depression introduced it to the country at large. I do not mean to say that taxes were levied in pre-depression years specifically and declaredly to create jobs but the use of the public funds had that effect. And, as always happens under such circumstances, some of the tax money gets away without any visible accomplishment, some of it finds expression in the comparative splendor and magnitude of public services and buildings and the number and relative opulence of public employees.

New Complexities in Politics

Of course, the mines constitute the great bulk of the taxable property on all of the iron ranges and in many of the communities the assessed value of the mines is so large in relation to the size and population of the local taxing jurisdictions that even a normal rate of taxation produces revenue enormously in excess of public needs even liberally estimated.

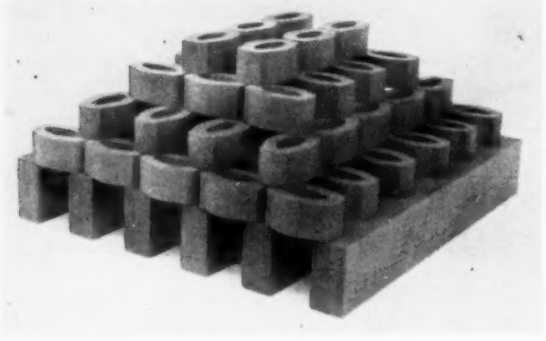
Under the leadership of clever men the populations of some of these communities have discovered that the objectives of socialism can be attained within the framework of existing law, that the income from property may be effectively sequestered and appropriated without any responsibility of ownership and management. The dominant Farmer-Labor party in Minnesota, witness to the opulence of the revenues of the Mesabi range communities, now proposes to confiscate the mines in the name of the state, a short cut to an end already in view unless it be that shipments return to a volume large enough to enable the mines to meet taxes at existing levels.

In conclusion may I observe that in these days the economist has become the politician. I wish it were that the politician had become the economist. We could then rest assured that the Minnesota mines would remain in the hands of their owners, that discriminating tax laws by which they are oppressed would be repealed, that the proposed free passage of ore-carrying ocean freighters from the Atlantic to the Lakes would not materialize, and that the industrial strength of our country and its power abroad would not be impaired.

New Checkers Aid Economy In Open-Hearth Regenerators

BY K. H. MOLL and PAUL STICKEL*

IT HAS always been a desirable feature to have the largest possible heating surface in open-hearth furnace regenerator chambers in order to reduce fuel consumption and to get highest possible flame temperature combined with greatest uniformity. Practical observation, supported by scientific research, has established the fact that the larger the heating surface of a checker chamber the more heat from the waste gases is being absorbed and exchanged during the blast.

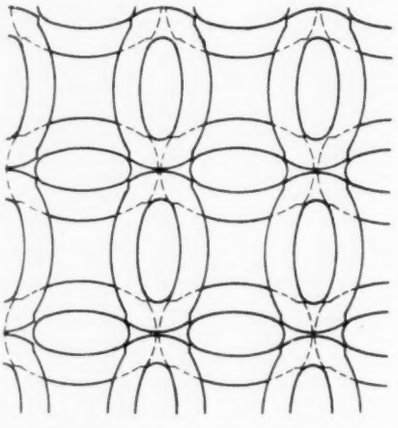


THIS illustrates how the Moll checkers are set up. Size of each brick: 11 *inches long,* 4½ *inches wide,* 4 *inches high,* 2-*inch walls*

Because of shortage of fuel in European countries, steelmakers there several years ago were forced to study heat transfer in checker chambers of open-hearth furnaces, with a view to improving economy. One result of this research was the development in 1926 of a new form of checker brick with increased heating surface, known as the Moll checker, designed by K. H. Moll, a German steelmaker. This type of checker, shown in the accompanying illustration, has been marketed in foreign countries to the extent of over 6,000,000. Manufacturing and marketing rights in this country have been taken over by the General Refractories Co., Philadelphia.

It has been observed that the penetration of a checker brick by heat is a direct function of temperature, gas velocity and time of exposure. Considering standard condition in a furnace and a cycle of 20 minutes, penetration is observed to be ¾-1 inch from the surface of the checker at a high temperature, at the top of the chamber. At lower or colder section it is about ½-¾ inch. The heat in this brick-volume is conducted to the surface during the blasting period and absorbed by the air.

The most efficient brick size for the top of a chamber is, therefore, a checker with 2-inch thick walls. A heavier checker does not improve heat exchange which is the prime function of a furnace chamber. The B.t.u.'s in the dormant core of a heavy checker, absorbed during operation, are not conducted to the surface and absorbed by the blast, for this reason: Since heat absorption on the surface is proceeding at a high rate and the heat conduction of the refractory material is comparatively low, no time remains in which this inner heat can be conducted to the surface.



Sketch showing plan view of a Moll checkered chamber; free area in the checker 7 *by* 3⅛ *inches, between checkers* 4 *by* 4 *inches*

A checker brick "breathes" within the limits of 1-inch in the high temperature range and ½-inch in the low range. A simple test shows this breathing. A checker chamber with standard checkers at the end of the blast will show a lower surface temperature than it does a few minutes after the end of the blast. Reason for this temperature increase is the conduction of heat, stored in the core, to the surface.

Comparison of heating surface per cubic foot of checker volume and weight per cubic foot of checker volume of various sizes of checkers is as follows:

Checker size, inches	Heating surface per cu. ft. checker volume	Weight in lbs. per cu. ft. checker volume
Moll checkers	5.89	47.3
13½ x 4½ x 4½	2.92	42.0
10½ x 4½ x 4½	3.51	53.8
9 x 6 x 3.....	3.50	41.0
10½ x 4½ x 3....	3.28	35.0

In the chambers of a 150-ton open-hearth furnace, the Moll and standard checkering are as follows:

Size of the chambers—

Air: Length 31 feet, width 12 feet 3 inches, height of wall 10 feet 10½ inches

Gas: Length 31 feet, width 8 feet 2 inches, height of wall 10 feet 10½ inches.

Air Chamber

	Moll checkers	Standard setting
Checker volume, cu. ft.	4,130	4,130
Heating surface, sq. ft.	24,500	12,060
Checker weight, lbs.	202,000	183,000
Heating surface per ton checker work, sq. ft.	243	132
Free horizontal area sq. ft.	164	170

Gas Chamber

Checker volume, cu. ft.	2,753	2,753
Heating surface, sq. ft.	15,400	8,039
Checker weight, lbs.	127,000	120,000
Heating surface per ton checker work, sq. ft.	213	134
Free horizontal area sq. ft.	108	114

The increase of heating surface with Moll checkers is about 103 and 91 per cent, respectively, for air chamber and gas chamber. While the weight or storage capacity increases only slightly, the increase of heating surface per ton from 132 square feet to 243 is the best indication of the higher heat transfer and therefore more efficient furnace. The Moll checkering also compares favorably with other checker sizes.

As the waste gases must pass more heat absorbing surfaces they leave the chamber with a lower temperature. The result is a higher preheating of the air or gas, respectively, and a higher and more uniform flame temperature.

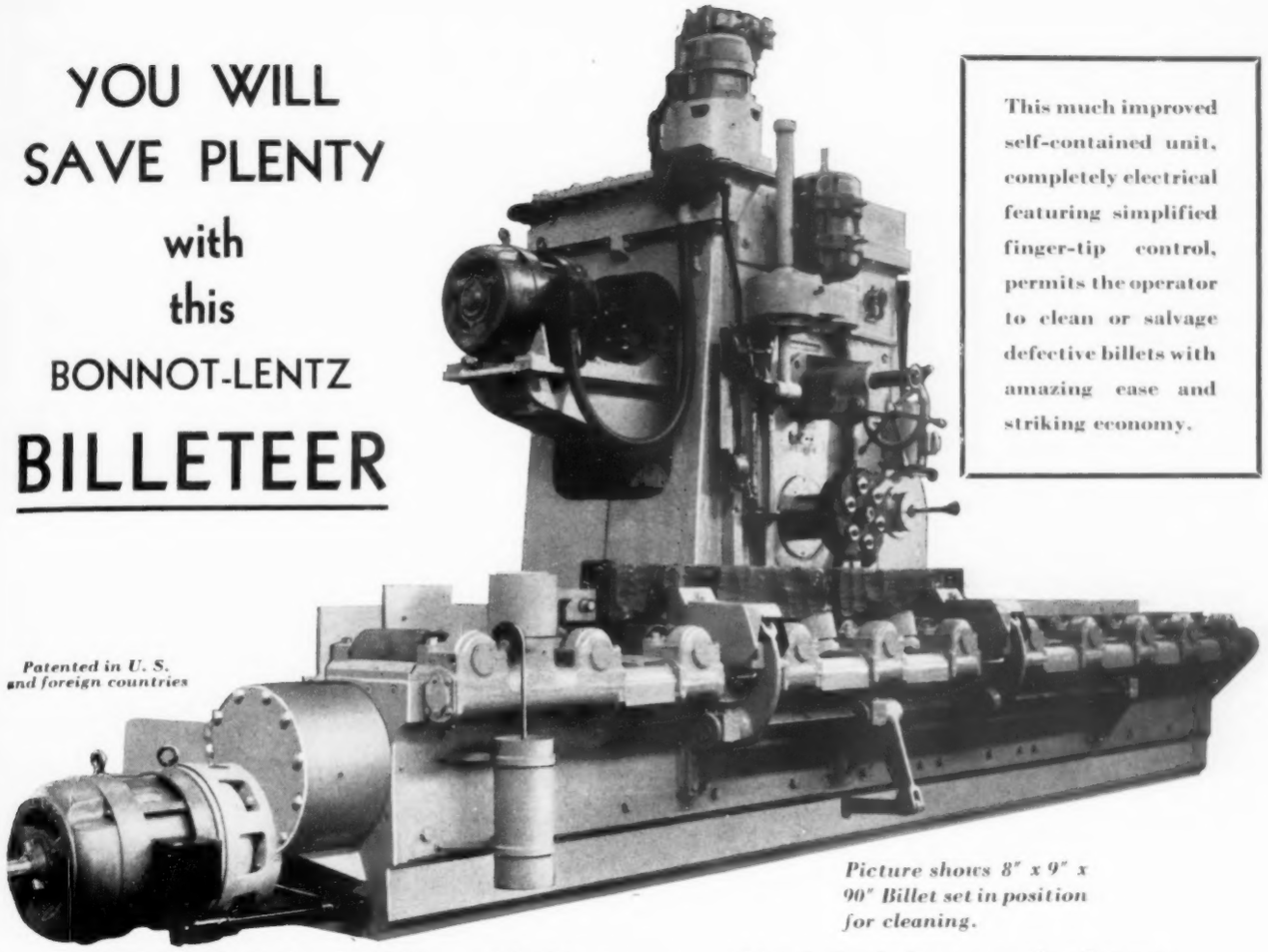
Actual tests on open hearth fur-

(*Please turn to Page* 49)

*A paper presented at the seventeenth conference of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers in Pittsburgh, June 28-29. The authors: K. H. Moll, German steelmaker and inventor of the Moll checker; P. Stickel, Milwaukee consulting engineer and personal representative of Mr. Moll in this country.

YOU WILL SAVE PLENTY with this BONNOT-LENTZ BILLETEER

This much improved self-contained unit, completely electrical featuring simplified finger-tip control, permits the operator to clean or salvage defective billets with amazing ease and striking economy.



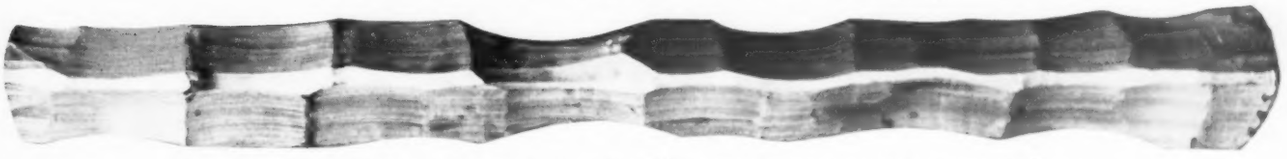
Patented in U. S. and foreign countries

Picture shows 8" x 9" x 90" Billet set in position for cleaning.

THE COST of cleaning billets with this proven machine is far below any other known method—so far in fact that it's *cheaper to own a Billeteer than to be without it.*

Billet above is Nickel-Moly, defects 7/8" deep readily cleaned with minimum time and metal loss.

Billet below is rather extreme example of high speed steel stock which was salvaged and used satisfactorily.



Ratios of 10-15-20 to 1 are shown by Billeteer in competitive tests of tonnage cleaned in a given period of time by Billeteer and by old methods.

Highest Capacity - Minimum Waste - Unified Controls
Powerful - Flexible - Rugged

Steel Equipment Division

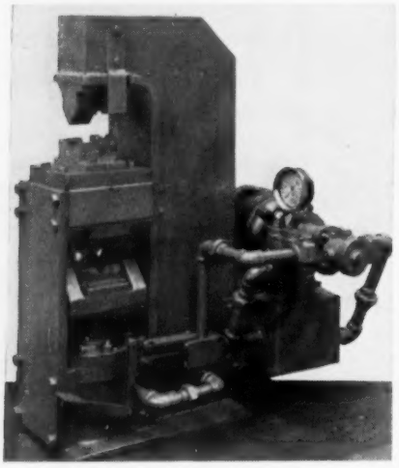
THE BONNOT CO.

CANTON, OHIO

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Press—Williams, White & Co., Moline, Ill., recently has developed a press which is a rod forming press, straightener, and shear. The equipment is operated hydraulically and will handle stock up to 1-inch in diameter. It is adapted to bending and straightening gaggers, reclaiming bolts and tie rods, for production bending and shearing.



Williams, White & Co. rod forming press, straightener and shear

The shearing and bending dies are in the upper block, the straightening dies in the lower block, and are made up of a series of V blocks which overlap each other. No change in setup is necessary to perform any of the different operations.

Hydraulic power is supplied by a self-contained pumping plant in the rear of the machine, shown herewith, which has sufficient volume at low pressure for rapid transverse stroke, and small volume at high pressure for the working stroke. The pumps are coupled directly to a 5 horsepower motor. The unit includes release valves for cutting out the low pressure pump at the end of the transverse stroke, and high pressure pump when maximum load is reached. Operation is controlled by a foot treadle.

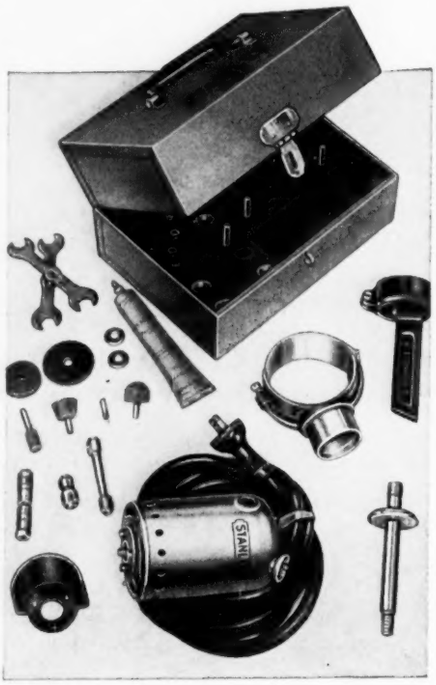
♦ ♦ ♦

Rubber Tired Industrial Wheels—B. F. Goodrich Co., Akron, O., is announcing a complete line of rubber tired industrial wheels, especially designed to replace obsolete steel wheels on equipment already in service. Known as "Vulc-On," the line now is available in a wide assortment of sizes and types to meet practically every operating condition, in factories, docks, loading platforms and warehouses.

The new line gets its name from the fact that the rubber tire is permanently bonded to the wheel. This is accomplished by vulcanizing the rubber to the metal by the same process used in manufacture of solid truck tires. Tires are constructed of the Goodrich roller compound tread, which affords maximum cushion to floors and load. Standard, cage-type, antifriction roller bearings are used in the one-piece metal wheels. Standard lubrication fittings are provided for.

♦ ♦ ♦

Toolroom Grinder—Stanley Electric Tool Co., New Britain, Conn., recently brought out a No. 585 toolroom grinder. Mounted in a lathe, miller or shaper or in a special Stanley bench stand, a variety of abrasive wheels — either straight or mounted—may be used to grind the openings in all kinds of dies and jigs, grind keyways and slots and for other internal and external grinding operations. As a hand tool it can be used to grind machine parts and for rough off hand grinding on small castings or forgings. With a metal cutting bit it can be used to machine aluminum patterns, brass templets and for similar work on all nonferrous metals.



Stanley toolroom grinder designed to fit into compact metal case

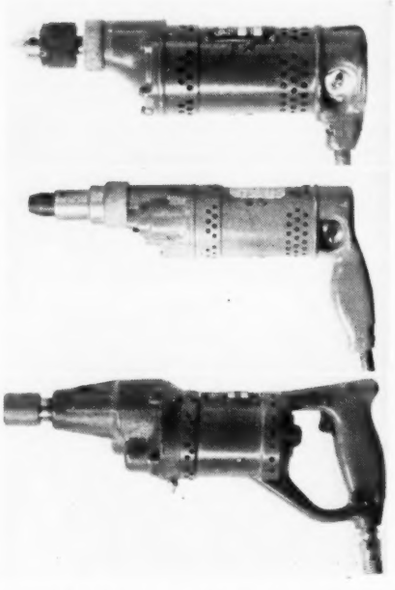
The grinder is equipped with a ⅜-horsepower universal motor, 18,000 revolutions per minute and will drive a 1½-inch x ½-inch wheel. It is furnished complete with motor unit holders, wheels, bit wrenches and lubricant as illustrated herewith. These, together with the motor unit, fit into a compact metal carrying case which keeps the unit together and makes it easy to store in the tool crib and convenient to carry from job to job.

♦ ♦ ♦

Electric Tools—Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, recently announced three new Hicycle electric tools, No. 14 electric drill, No. 15N screw driver and No. 00N nut runner. These are shown in the accompanying illustration in the order named, beginning with the top view. The drill is designed for drilling up to 3/16 inch, has a quick-acting unit switch and a squirrel cage induction motor. The tool operates from 220 volts, 3-phase, 180 cycles.

The screw driver is light in weight and handles easily, according to claims. A positive jaw-clutch is built into the nose of the gear case. Screw drivers can be furnished with bits or finders in rotating or non-rotating types for any head or type of screw within the capacity of the tool.

A heavy-duty, self-contained switch mounted in the saw-type



Hicycle electric tools—drill, screw driver and nut runner

Why so UNIFORM ?

IT'S THE CUSTOM-MADE STEEL THAT SPELLS THE DIFFERENCE!

IT IS Roebling's custom method of making welding steel that does the trick...that enables Roebling to produce welding wire which is absolutely uniform in quality... bundle after bundle, carload after carload.

Special, pure melting stock to begin with. Small heats in Roebling open-hearth furnaces. Close, accurate control of every process. Steel custom-made specifically for welding purposes...that's the answer.

May we send you data and samples of Roebling Custom-made Welding Wire? Made in both electric and gas types.

JOHN A. ROEBLING'S SONS CO., TRENTON, N. J.
Branches in Principal Cities Export Dept. New York, N. Y.

ROEBLING WELDING CABLES: these cables are made in a complete line for arc welding purposes. Many leading welders consider them to be the finest welding cables on the market. Samples, data and prices gladly furnished.

PLAIN RUBBER TYPE
Roebling Welding Cable

BRAIDED TYPE
Roebling Welding Cable

ROEBLING WELDING WIRE

Custom Made

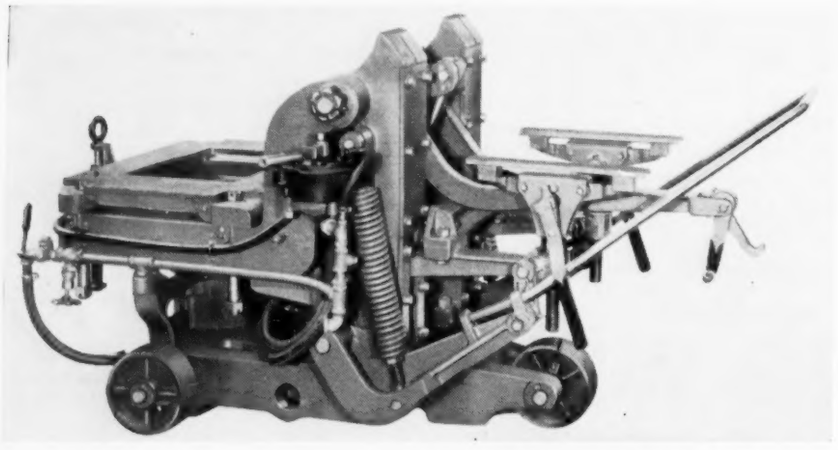
pistol grip handle of the No. 00N nut runner, is actuated by an inside trigger. The positive type clutch disengages when forward pressure on the tool is released. On special order these tools can be equipped with special non-rotating clutch with a bell-mouth stationary finder.

♦ ♦ ♦

Molding Machine — Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland, calls attention to the fact that a single cylinder air-operated rollover mechanism features its jolt rockover type pattern draw molding machine. Both rollover and rollback operations are controlled by a single operating valve of new design. The motion of the table in both directions is smooth and steady, coming to rest gently and positively. This movement is adjustable to suit the weight of the job being handled.

The jolt operation is controlled by the balanced jolt valve which provides for adjustment both as to length of stroke and hardness of blow. A hand-operated clamp of the eccentric type holds the flask and bottom board firmly in position during the rollover operation. The table plate is kept in alignment by four guide pins and is locked automatically to the rollover table frame at four points preparatory to rolling over.

The pattern draw operation is performed quickly and easily by hand, the load being counterbalanced by adjustable spring tension. The design includes large V-type guides with broad wearing surfaces to give long and accurate service. A levelling device is provided to maintain accuracy of draw regardless of variations in shape or position of bottom board. The machine, shown herewith, is mounted on wide faced wheels to facilitate convenient movement about the foundry.



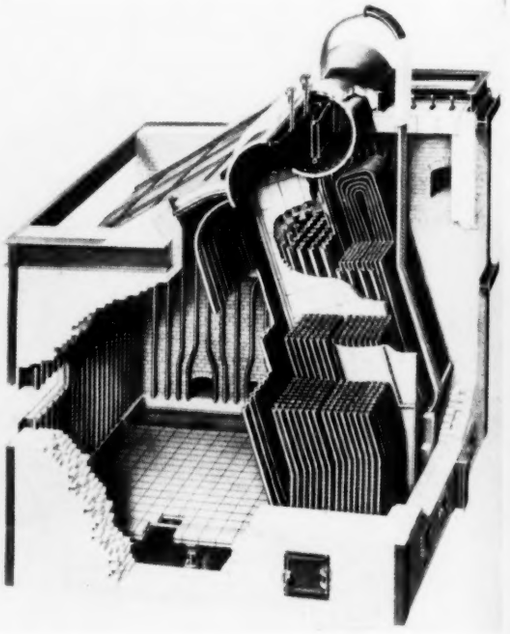
In this Osborn jolt rockover pattern draw molding machine smooth steady operation is provided for the table as it moves in either direction

♦ ♦ ♦

Integral Furnace Boiler—Babcock & Wilcox Co., 85 Liberty street, New York, recently developed a new boiler unit, shown herewith, designed to provide a completely co-ordinated unit comprising a two-drum boiler, a water-cooled furnace, burners for liquid, gaseous, or pulverized solid fuels, and, when needed, a superheater, economizer, and an air heater. This unit is particularly applicable in industrial plants where operation at high nominal ratings with high final steam temperatures, and where high efficiency is desired.

Arrangement of the boiler proper, with inclined tubes entering an upper and a lower drum, and with the furnace paralleling the drums and separated from the rows of tubes by a furnace wall, instead of the conventional arrangement of boiler set over furnace, makes its installation advantageous where headroom is limited.

The furnace is water-cooled to assure low maintenance costs and minimum outage for repairs and replacements. This feature is shown by the arrangement of the cooling-water tubes, the simplicity of the supporting structure, the use of but two headers, and the necessity for but one small section of steel casing. Boiler tubes are arranged in three passes, and are so spaced as to secure maximum heat transfer consistent with a draft loss that is sufficiently low to permit operation with natural draft up to fairly high ratings. The exceptionally high efficiency of this boiler is also due, in part, to the cross-flow of gases over the tubes in all passes and to the fact that practically all the draft resistance is effective in promoting heat transfer, because of the scrubbing action of the gases on the tubes.



INTEGRAL furnace boiler developed by Babcock & Wilcox Co. Tubes in first pass are 3¼ inches in diameter, and the diameter of those in succeeding passes is 2 inches. Thus, those tubes subjected to the most severe conditions, and in which scale is most liable to accumulate, are of large size and easy to clean. Drums are of fusion welded or, if desired, riveted construction

♦ ♦ ♦

Conveyor-Screen—Progressor Conveyor, 205 West Wacker drive, Chicago, is introducing a conveyor-screen for handling sand, coal and other materials either horizontally or up an incline. The conveyor operates on a lift-throw principle.

The trough is mounted on parallel shafts having eccentric pin extensions. These shafts oscillate through

"PERSONAL"

THIS MESSAGE APPLIES ONLY TO YOUR PRODUCTS

THE wide variation of fabrication methods—and the countless conditions of service to which wire is subjected—these factors make its use a personal application problem for your product only. To determine the exact size and the precise grade, the special shape or analysis that will perfectly serve your need—is very definitely a part of this company's service. We render this truly personal service as a part of the unceasing vigilance that guards every detail of our production and assures the superior quality and constant uniformity which maintains our leadership. We will welcome the opportunity of explaining in detail just how this individual method of operation will bring you added value—and possibly added profit. Your request will bring complete and interesting information.

Premier Spring Wire, Weaving Wire, Pin Wire, Bolt, Rivet and Screw Wire, Broom and Brush Wire, Pinion Wire, Basic and Bessemer Screw Stock, Premier Tested Welding Wire, Flat Nut Stock, Hair Pin Wire, Mattress Wire, Music Spring Wire, Cold Finished Steel Bars, Pump Rod Bars, Wool Wire, Piano Wire and Wire Rods. Also U S S Stainless and Heat Resisting Wire.

1831 MORE THAN 100 YEARS OF PROGRESS IN WIRE MAKING 1934

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago
94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
AND ALL PRINCIPAL CITIES

Empire State Building, New York
First National Bank Building, Baltimore

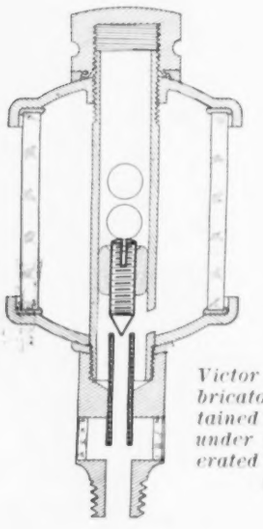
Pacific Coast Distributors: Columbia Steel Company, Russ Bldg., San Francisco

Export Distributors: United States Steel Products Company, New York

connecting rods operated by a revolving crank shaft which is motor-driven, the oscillations imparting a positive conveying motion up to 40 feet per minute. Furnished in various sizes, an 18-inch conveyor is designed to handle as much as 100 tons of sand per hour.

♦ ♦ ♦

Lubricator—Victor Lubricator Co., 360 North Michigan avenue, Chicago, recently announced a new 1000 series automatic force-feed lubricator incorporating a number of important improvements. Cadmium plated steel replaces brass, a new sight feed provides double visibility—reservoir supply as well as rate of feed; larger filler tube permits easy, fast filling; a new top stamping, drawn and threaded, eliminates the hex nut formerly required. A new cap, redesigned to include a patented washer retainer, eliminates the cap retaining wire previously used, and a new valve control inside the filler tube, discourages tampering with the initial adjustment.



Victor force-feed lubricator is self-contained and feeds oil under pressure generated within the unit

The new unit, shown herewith, is of air-tight construction, is completely self-contained, and feeds oil under pressure generated within the lubricator (not by gravity) as dictated by the bearing's actual needs. Oil temperature variances, by causing expansion or contraction of the fractional cubic inch of air imprisoned near the base of the filler tube, regulate the rate of oil flow.

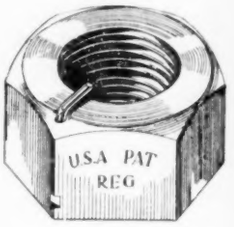
♦ ♦ ♦

Electric Glue Pot—Russell Electric Co., 364 West Huron street, Chicago, has developed an electric glue pot which is thermostatically controlled. It is claimed that the pot will hold glue temperatures within 1 degree Fahr.

Double asbestos insulation prevents loss of heat through radiation, so that the outside shell of the pot is barely warm. The mica insulated element, according to the manufacturer, will not absorb moisture, and therefore will not ground and cause shocks. The element may be replaced easily. The pots are manufactured for use either with 110 or 220 volts.

♦ ♦ ♦

Automatic Lock Nut—Automatic Nut Co. Inc., Chrysler building, New York, has placed on the market an automatic lock nut, simple in design, and which fits any standard thread, U. S. S. or S. A. E. This lock nut, as shown in accompanying illustration, is a single unit, requiring no lock washers or cotter pins. Built integrally with it is a locking pin. When applying the nut, this pin, which is of chrome vanadium rustless steel with a high percentage of nickel, is engaged by the thread of the bolt, following the thread. This turns the pin at an angle and establishes a point of impingement perpetually against vibration and shock. Important features of this nut are that it is absolutely foolproof; can be put on and taken off the same as any ordinary nut, and used time and time again without impairing the thread on the bolt; and can be locked or unlocked at the will of the mechanic but not by vibration.



Automatic lock nut recently introduced by Automatic Nut Co. Inc., to fit any standard thread

Sharp Drop in Machine Tool Building Revealed in Biennial Census

DECREASE of 58.5 per cent in the value of machine tools made in the United States in 1933, compared with 1931, is shown by preliminary tabulations of data collected in the biennial census of manufactures taken this year by the bureau of the census, department of commerce, Washington. Indicated total for 1933 (at f.o.b. fac-

Census of Machine Tool Manufacture, 1933 and 1931

	1933	1931	Decrease, per cent
Number of establishments	239	279	14.3
Wage earners (average for the year)[1]	12,683	21,262	40.3
Wages[2]	$12,584,182	$25,149,816	50.0
Cost of materials, fuel and purchased electric energy[2]	$10,834,209	$21,900,879	49.5
Products, total value[2]	$41,509,568	$81,286,568	48.9
Machine tools[3]	$22,857,875	$55,109,887	58.5
Replacements and repair parts[3]	$5,963,497	$7,504,327	20.5
Other products, value and receipts for contract and repair work[3]	$12,688,196	$18,672,354	32.0
Value added by manufacture[4]	$30,675,359	$59,385,689	48.3

[1]Not including salaried officers and employes. Data for such officers and employes will be included in a later report. The item for wage earners is an average of the numbers reported for the several months of the year. In calculating it, equal weight must be given to full-time and part-time wage earners (not reported separately by manufacturers), and for this reason it exceeds the number that would have been required to perform the work done in the industry if all wage earners had been employed continuously throughout the year. The quotient obtained by dividing the amount of wages by the average number of wage earners cannot, therefore, be accepted as representing the average wage received by full-time wage earners. In making comparisons between the figures for 1933 and those for 1931, the possibility that the proportion of part-time employment was larger in one year than in the other should be taken into account.

[2]Manufacturers' profits or losses cannot be calculated from the census figures because no data are collected for certain expense items such as salaries, interest, rent, depreciation, taxes, insurance and advertising.

[3]Reported in part by unimportant establishments on the abbreviated schedule mentioned in paragraph 3 of the text.

[4]Value of products less cost of materials, fuel and purchased electric energy.

tory prices) was $22,857,875, compared with $55,109,887 reported for 1931, the last preceding census year.

More important items which contributed to the total for 1933 are as follows: Boring machines, $884,811; drilling machines, $1,624,713; forging machines, $452,689; gear-cutting machines, $1,028,288; grinding machines, $3,589,189; lathes, $3,869,329; milling machines, $1,335,280; portable tools (electric and pneumatic drills, grinders and hammers, portable motor-driven garage equipment and flexible-shaft machines), $4,784,074; and presses (stamping, forming and the like), $1,614,604.

Abbreviated Schedule Adopted

For this census, in order to reduce the cost of the field work, an abbreviated schedule was used for the unimportant establishments in many industries, including the machine tool industry. This schedule called merely for data on employes, their compensation, cost of materials, fuel and purchased electric energy, and total value of products, with no breakdown as to kind or quantity. The combined value of products reported under this schedule, $1,907,267, amounted to 4.6 per cent of the total value of products made in the industry. This amount has been distributed among the various items under the "Products" heading in the accompanying table on the basis of the ratios between the values of these classes of products reported on the standard schedule.

The machine tool industry, as defined for census purposes, embraces establishments engaged wholly or principally in the manufacture of that class of power-driven machines generally designated by the term "machine tools," but it does not cover the manufacture of certain types of machines designed for working metal, especially sheet metal working machines, welding machines, wiredrawing machines, and wireworking machines.

Summary of statistics for 1933 in comparison with 1931 is presented in the accompanying table. All figures for 1933 are preliminary and subject to revision.

Checkers Aid Economy In Regenerator Chambers

(*Concluded from Page* 42)

naces with Moll checkers have shown the air entering the furnace at about 150-250 degrees Fahr. higher and the stack gases leaving the chamber at about 200-250 degrees Fahr. lower temperature than in furnaces with solid checkers. The drop of temperature was found to be about 10-25 per cent less.

An increase of the melting rate of from 5-20 per cent and more was observed over months of continuous operation on many furnaces. The fuel saving paid for the checkers in a short time.

Exchanges 62 Per Cent of Heat

During a cycle of 20 minutes a 4½-inch checker exchanges about 33 per cent of its total absorbed heat, whereas the Moll checker exchanges about 62 per cent. The rate of exchange of B.t.u.'s of a 4½-inch checker could be increased by blasting for a longer period; however, this procedure is not desirable as the flame temperature in the furnace would drop to a point where operation causes trouble.

It will be noted from the illustration that the Moll checker embodies a simple shape, the wide bearing surface insuring stability of the checkerwork. It also offers large free horizontal area. With the curved walls and rounded ends the Moll checker provides for maximum heating surface, free volume and yet high storage capacity. Heating gases are able to play freely all around the surfaces except on the bearing surface. The thought behind the development of this checker was to reduce dead brick weight to the absolute minimum and to put the entire brick material to work for heat exchange.

The free horizontal area in a Moll checker chamber is practically the same as with other standard checkers. The bearing surface is larger than on a 4½-inch checker and the surface pressure is lower, adding to safety in a high checker chamber.

A.S.M. Announces Papers For 1934 Metal Congress

(*Concluded from Page* 30)

posited Weld Metal, by S. A. Hoyt, A. O. Smith Corp., Milwaukee.

"Nonmetallic Inclusions in Steel," by S. F. Urban and John Chipman, University of Michigan, Ann Arbor, Mich.

"New X-Ray Exposure Charts for Steel," by H. R. Isenburger, St. John X-Ray Service Inc., New York.

"Grain Distortion in Metals During Heat Treatment," by C. Nusbaum, Case School of Applied Science, Cleveland, and N. P. Goss, Cold Metal Process Co., Youngstown, O.

"Directional Properties in Rolled and Annealed Low Carbon Steel," by Arthur Phillips and H. H. Funkle, Yale university, New Haven, Conn.

"Ductility of Chromium-Nickel Austenitic Steels at Elevated Temperatures," by H. D. Newell, Babcock & Wilcox Tube Co., Beaver Falls, Pa.

"Influence of Oxide Films on the Wear of Steel," by S. J. Rosenberg and Louis Jordan, national bureau of standards, Washington.

"Metastability of Cementite," by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

"Cobalt-Molybdenum System," by W. P. Sykes and Howard F. Graff, General Electric Co., Cleveland.

"Practical Observations of Some High Carbon, High Chromium Tool Steels," by W. H. Wills, Ludlum Steel Co., Dunkirk, N. Y.

"New Development in Electrical Steels Characterized by a Fine Grained Structure Approaching the Properties of Small Single Crystals," by N. P. Goss, Cold Metal Process Co., Youngstown, O.

"Inspection Technique," by research staff, Kelley Koett Mfg. Co., Covington, Ky.

"Magnetic Properties of Iron-Silicon Alloys," by T. Y. Yensen, Pittsburgh, and N. L. Zeigler, West Penn Electric Co., Pittsburgh.

"Introduction of Grain Size Symposium," M. A. Grossmann, Illinois Steel Co., Chicago.

"Effects of McQuaid-Ehn Grain Size and Fracture Appearance as Influenced by Nature of the Steel," by Philip Schane Jr. and T. W. Woodward, Carnegie Steel Co., Pittsburgh.

"P-F Characteristic of Steel," by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J.

"Heat Treatment in Controlled Atmospheres Including Gaseous Carburizing," by C. R. Austin, Pittsburgh.

"Graphical Methods for Calculating Heat Transfer Through Furnace Walls," by C. E. Weinland, Johns-Manville Research Laboratories, Manville, N. J.

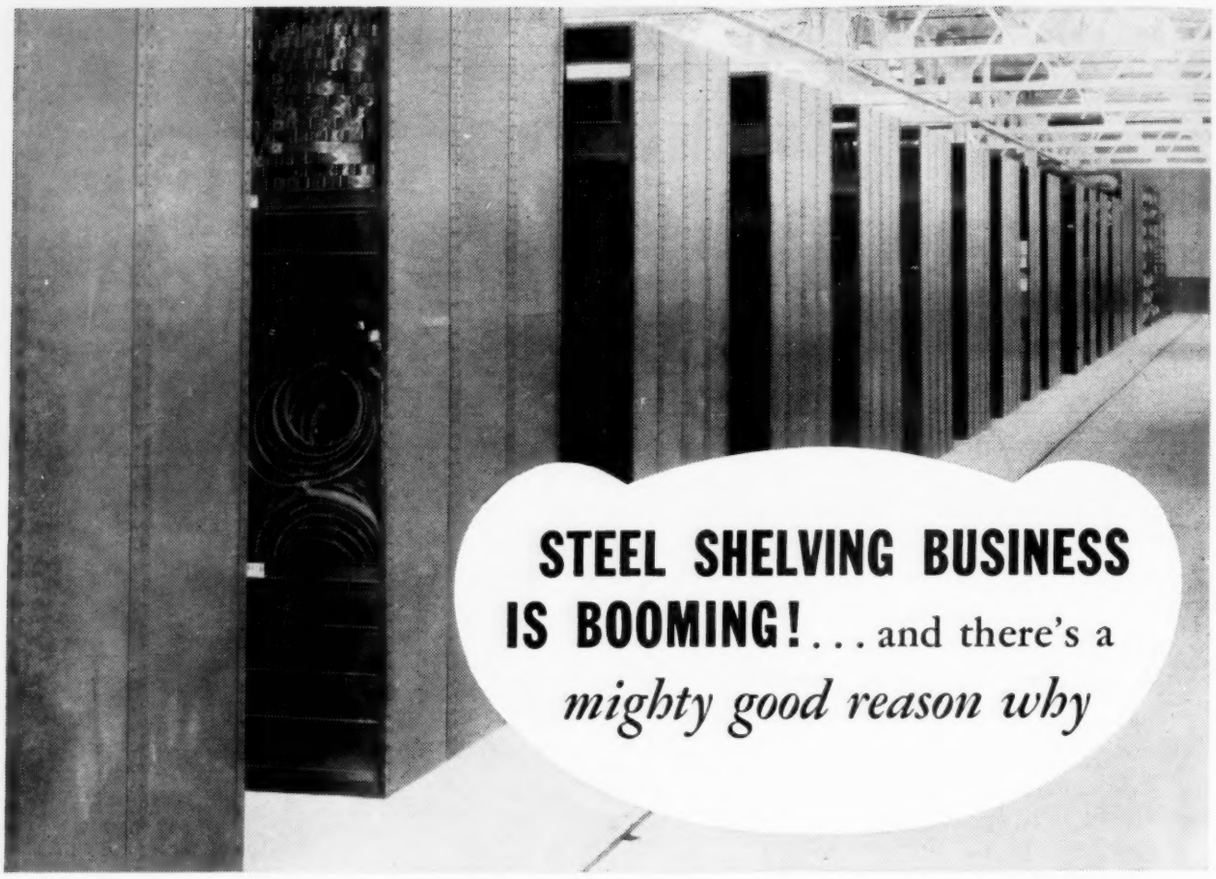
Trade Publications

SHEET PILING—Inland Steel Co., First National Bank building, Chicago, has issued its No. 3 catalog on steel sheet piling, including data on the Inland sections, illustrations and descriptions of several construction projects, standard extras on sheet piling and a number of tables essential to piling projects.

ARMORED SLAB—Carnegie Steel Co., Pittsburgh, describes its armored bridge roadway slabs and heavy duty floors in a current bulletin. Ample illustrations bring to the eye the principle of the locked steel I-beam structure and the description covers details of its use in varied applications where strength and resistance to wear are demanded and weight must be saved.

STAINLESS-CLAD STEEL—A guide to the fabrication of stainless-clad steel has been issued by the Ingersoll Steel & Disc Co., 310 South Michigan avenue, Chicago. It consists of 16 pages and covers various methods of welding, soldering, lock-seaming, riveting, deep drawing, pickling and heat treating. It contains many diagrams to guide the fabricator. An illustrated section shows actual installations and applications of stainless-clad in a wide range of industries.

ACID PUMPS—A bulletin, No. 172, by the Duriron Co., Dayton, O., is devoted to centrifugal pumps for handling acids and alkalies, covering a new series of pumps. Inserts will be issued on each pump, giving capacities, dimensions and rating charges. Features of the new pumps include one-piece base, volute held under compression to eliminate strain, closed-type impellers with two or more sizes for each pump, bearings are removable bronze sleeves of special alloy.



STEEL SHELVING BUSINESS IS BOOMING!... and there's a *mighty good reason why*

LIGHT, strong, capacious, and fireproof—no wonder steel shelving gets the call in stores, libraries, and industrial plants alike. And when the shelving you make—or use—is made of Armco hot or cold-rolled sheets, it is sure to be all that you want it to be.

Good shelving—the kind for which discriminating users are willing to pay a fair price—must be neatly and stoutly made. It must assemble quickly, carry its load without sagging or twisting, and take up as little space as possible. Moreover, the finish must adhere tenaciously if it is to stand up well under years of scuffing, scraping, and battering.

Armco Steel Sheets meet these specifications; and this is why they are used by the leading manufacturers of better shelving—the kind chosen by wise buyers. Whether hot-rolled, cold-rolled, in copper-bearing steel, plain steel or long terne, the metal is remarkably uniform, flat and true to size and gage. It takes paint, lacquer and other finishes readily, and holds them long. Armco Steel, in short, benefits both makers and users of durable steel shelving.

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If you are a user of steel shelving, we can help you get improved equipment that saves you money and satisfies you better. If you make steel shelving or related equipment, there are cost-saving and product-improving features in Armco Sheets that you will want to know about. Just write for the information you want.

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Expect Automotive Buying To Lift Demand

Releases for New Models To Begin in Last Half of August—Shape Awards Heavier—Operating Rate 29½ Per Cent—Scrap Prices Lower

JULY has been written off by steelmakers as a period of absorption of consumers' stocks, and the year's low point in new tonnage, while they appear confident the approaching month will bring some improvement, especially in commitments by automobile manufacturers.

These manufacturers now are releasing only material to round out inventories, unbalanced by the seasonally-strong rate of production, with which to complete schedules for current models. Between Aug. 15 and Sept. 1 they are expected to begin releasing for new models. Inquiries have already been issued direct by some producers and partsmakers.

The reliance which steelmakers place on automobile manufacture to supply tonnage in the future, and thereby absorb some of the slack in other channels of consumption is indicated by the construction or authorization of mills with annual capacity for rolling 3,690,000 tons of sheets and strip, of the class mainly used by the automobile industry, at a cost of $42,000,000. In the same period—since the steel code went in effect last August—expansion in facilities for rolling other finished steel products has been limited to two small tube mills, while no raw steel or pig iron capacity has been built.

Structural Awards Increase; $6,000,000 Worth of Machinery Pending for Coulee Dam

In contrast to the widespread contraction in steel orders from practically all consuming groups last week, structural steel awards increased to 19,620 tons, nearly double the amount placed in the preceding week. Federal and state government work still is the chief support of the structural steel market, with only a sprinkling of industrial needs.

Demand for steel for western dam projects is the most active feature of the markets. For Boulder dam 5500 tons of concrete bars was awarded. General contractors for the Grand Coulee dam, Washington, which in steel requirements rivals that of Boulder dam, are in the market for $6,000,000 in machinery and equipment for delivery within three months. New projects include 5000 tons of structural shapes for a state viaduct in Baltimore. Contractors for Cleveland's easterly disposal plant are expected this week to award 4100 tons of steel.

Early action is contemplated on the 24 naval ships requiring 42,000 tons of steel, bids for which will be opened Aug. 15, half the number to be placed with private builders, others with government yards. Oil companies have awarded a few tanks, requiring moderate size tonnages of plates. The Pennsylvania railroad has released 28 electric locomotives, originally ordered in 1931. Construction of 2500 to 3000 hopper cars is being considered by an eastern railroad.

Municipalities, facing formidable tax delinquencies, despite offers of federal financing are presenting the poorest market in years for pipe. Boston has purchased 1572 tons of steel pipe; Chicago is to award 2228 tons of cast pipe shortly.

Farm Buying Expected To Improve Despite Drouth; Market for Raw Materials Quiet

Steelmakers anticipate a good volume of buying from agricultural districts in the fall. In the areas where the drouth has not been severe, heavy crops are maturing. In addition, farmers in the Central West will be subsidized to the extent of a half billion dollars.

Scrap prices show further easiness in all districts, STEEL's iron and steel scrap composite off 4 cents to $10.25. Foundry operations in the Middle West are down to 35 per cent; pig iron producers do not look for resumption in buying until late in August. Domestic fluorspar has been reduced $1 to $1.50 a ton.

Steel prices show no further deflection, but lack a test. Rigid electrical conduit, a product which does not come under the provisions of the steel code, has been advanced $8 a ton.

Steelworks operations, as a national average last week dropped a half point to 29½ per cent, lowest since the second week in January. Youngstown advanced 4 points to 35 per cent, Buffalo 8 to 29; Cleveland dropped 3 to 33, New England 4 to 48, eastern Pennsylvania 2½ to 22½, Pittsburgh 1 to 20; while Detroit remained at 76, Chicago 34, Birmingham 20, and Wheeling 27.

STEEL's iron and steel composite is unchanged at $34.19, while the finished steel composite remains $54.

COMPOSITE MARKET AVERAGES

	July 28	July 21	One Month Ago June, 1934	Three Months Ago April, 1934	One Year Ago July, 1933	Ten Years Ago July, 1924
Iron and Steel Composite	$34.19	$34.19	$34.89	$34.18	$29.81	$39.78
Finished Steel Composite	54.00	54.00	55.08	53.90	47.20	63.53
Steelworks Scrap Composite	10.25	10.29	10.32	12.15	10.66	14.87

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	July 28, 1934	June, 1934	April, 1934	July, 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.90	1.85	1.60
Steel bars, Chicago	1.85	1.95	1.90	1.70
Steel bars, Philadelphia	2.09	2.19	2.15¼	1.91
Iron bars, Terre Haute, Ind.	1.75	1.85	1.60	1.65
Shapes, Pittsburgh	1.80	1.85	1.80	1.60
Shapes, Philadelphia	2.00½	2.05½	2.01¾	1.81½
Shapes, Chicago	1.85	1.90	1.85	1.70
Tank plates, Pittsburgh	1.80	1.85	1.80	1.60
Tank plates, Philadelphia	1.98½	2.03½	1.99¾	1.79½
Tank plates, Chicago	1.85	1.90	1.85	1.70
Sheets, No. 10, hot rolled, Pitts.	1.85	2.00	1.90	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.65	2.50	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.25	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	2.10	2.05	1.80
Sheets, No. 24, hot anneal., Gary	2.55	2.75	2.65	2.35
Sheets, No. 24, galvan., Gary	3.20	3.35	3.25	2.95
Plain wire, Pittsburgh	2.30	2.30	2.25	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.60	2.50	2.05
Semifinished Material				
Sheet bars, open-hearth, Yongs.	$28.00	30.00	28.40	26.00
Sheet bars, open-hearth, Pitts.	28.00	30.00	28.40	26.00
Billets, open-hearth, Pittsburgh	27.00	29.00	27.80	26.00
Wire rods, Pittsburgh	38.00	38.00	37.20	35.00

	July 28, 1934	June, 1934	April, 1934	July, 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.56	17.86
Basic, Valley	18.00	18.00	17.60	15.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.51	16.79
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.06	17.36
No. 2 foundry, Chicago	18.50	18.50	18.25	16.75
Southern, No. 2, Birmingham	14.50	14.50	14.25	12.60
No. 2X, Eastern del. Philadelphia	20.63	20.63	20.38	17.28
Malleable, Valley	18.50	18.50	18.10	16.10
Malleable, Chicago	18.50	18.50	18.25	16.75
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.88	18.68	16.93
Ferromanganese, del. Pittsburgh	89.79	90.00	90.24	84.44
Scrap				
Heavy melting steel, Pittsburgh	$12.00	11.90	14.15	12.70
Heavy melt. steel, No. 2, east. Pa.	8.50	8.87	9.50	9.35
Heavy melting steel, Chicago	9.50	9.75	11.75	10.45
Rails for rolling, Chicago	10.75	11.25	12.75	11.15
Railroad steel specialties, Chicago	10.25	11.25	12.75	11.15
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.30	2.40
Connellsville, foundry, ovens	4.60	4.60	4.55	2.85
Chicago, by-product foundry, del.	9.25	9.25	9.25	8.00

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock	
Pacific ports	2.45c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del	2.72c
F.o.b. cars, dock, Pacific ports	3.00c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Long ternes, No. 24 unassorted	3.45c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 2.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.80c
New York, del	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del	2.00½c
New York, del.	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports	2.35c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c
Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.	
Spring wire	3.20c
Chicago and Waukegan $1 higher, Worcester $2 higher.	

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 .15 to .25 Mo			0.50
4600 .20 to .30 Mo. 125-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon van.			0.95
9250....Carbon base plus extras			

Strip and Hoops □

Hot strip to 23/16-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham, base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pittsb., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½x6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Do., larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅜-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

½, butt weld	57½
⅛-inch, but weld	50½
¼—⅜, buttweld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts.. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron; 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
3-in & over, east fdy	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B. Stnd. fitgs., Birm. base..$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.,	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville Fur.	$3.60- 3.85
Connellsville fdry	4.60
Connell, prem. fdy.	5.35
New River fdry	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, Del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound,

†Naphthalene flakes and balls, in bbl.	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham.	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh dist. from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50 †Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.25	Lake Superior fur.	21.00
Pitts. dist. fur.	18.25	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%.	9.00
*Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.00
*Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20%, dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00

Spot, $5 a ton higher.

Silicomang., 2½ carb	90.00
2% carbon 95.00; 1%	105.00
Ferrochrome, 66-70 chromium 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high)	14.50
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base	9.50

Tubes and Pipes

High yellow brass	17.00
Seamless copper	17.25

Rods

High yellow brass	13.00
Copper, hot rolled	13.25

Anodes

Copper untrimmed	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.37½-4.62½
*Chicago	4.00- 4.25
Cleveland	4.75- 5.00
St. Louis	4.25- 4.50
Heavy Copper and Wire	
New York	6.00- 5.75
*Chicago, Na. 1	5.75- 6.00
Cleveland	5.75- 6.00
St. Louis	5.50- 5.75
Composition Brass Borings	
New York	4.12½-4.37½
Light Copper	
New York	4.62½-4.87½
*Chicago	4.50- 4.75
Cleveland	4.75- 5.00
St. Louis	4.50- 4.75
Light Brass	
*Chicago	2.12½-2.37½
Cleveland	2.75- 3.00
Lead	
New York	2.87½-3.12½
Cleveland	2.75- 2.90
Chicago	2.75- 3.00
*St. Louis	2.85- 3.00
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.25- 2.50
Aluminum	
Clips, soft, Cleve.	12.00-12.50
Borings, Cleveland	6.00- 6.25
Mixed, cast, Cleve.	9.25- 9.75
Mixed cast, St. L.	9.00-10.00

Secondary Metals

Brass ingot, 85-5-5-5	8.75
Stand. No. 12 Alum.	14.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00-10.00
Boston, dealers	5.25- 5.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	8.50- 9.00
Chicago, No. 1	9.25- 9.75
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa.	10.00
Eastern Pa., No. 2	8.00- 9.00
Federal, Ill.	7.25- 7.50
Granite City, R. R.	7.25- 7.75
Granite City, No. 2	6.25- 6.75
N. Y., deal. R. R.	7.00- 8.00
N. Y., deal. No. 2	5.50- 6.50
Pittsburgh, No. 1	11.75-12.25
St. Louis	6.50- 7.00
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	8.50- 9.00
Chicago, factory	8.50- 9.00
Cleveland	8.50- 9.00
Detroit	8.00- 8.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.25-11.75
St. Louis	5.00- 5.50
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.50- 7.00
Cleveland	7.00- 7.50
Pittsburgh	10.25-10.75
St. Louis	4.00- 4.25

SHEET CLIPPINGS LOOSE

Chicago	4.50- 5.00
Cincinnati	5.00- 5.50
Detroit	4.50- 5.00
St. Louis	3.75- 4.25

STEEL RAILS, SHORT

Birmingham	10.50-11.50
Buffalo	13.00-13.50
Chicago (3 ft.)	10.25-10.75
Chicago (2 ft.)	10.75-11.25
Cincinnati, del.	10.50-11.00
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft. & less	9.50-10.00

STEEL RAILS, SCRAP

Boston	5.25- 5.50
Chicago	9.25- 9.75
Pittsburgh	11.75-12.25

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	3.25- 3.75
Buffalo	8.50- 9.00
Chicago, net	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	6.00- 6.50

COUPLERS, SPRINGS

Buffalo	13.00-13.50
Chicago, springs	10.00-10.50
Eastern Pa.	13.50-14.00
Pittsburgh	13.75-14.25
St. Louis	8.00- 8.50

ANGLE BARS—STEEL

Chicago	10.00-10.50
St. Louis	7.75- 8.25

RAILROAD SPECIALTIES

Chicago	10.00-10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.00-14.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa. crops	15.00-15.50
Pittsburgh, billet, bloom crops	14.50-15.00
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	9.25- 9.75
St. Louis, cut	8.00- 8.50

SHOVELING STEEL

Chicago	9.25- 9.75
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.75- 7.00

RAILROAD WROUGHT

Birmingham	6.50- 7.00
Boston, dealers	**6.00- 6.50**
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	10.00-10.50
Chicago, No. 1 net	8.00- 8.50
Chicago, No. 2	9.25- 9.75
Cincinnati, No. 2	7.50- 8.00
Eastern Pa.	10.00
N. Y., No. 1 deal.	7.00- 7.50
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	7.50- 7.75

SPECIFICATION PIPE

Boston	3.50- 4.00
Eastern Pa.	9.00
New York, dealers	3.50- 3.75

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.25- 8.75
Cinci., No. 1 deal	6.00- 6.50
Cincinnati, No. 2	7.00- 7.25
Cleveland, No. 2	7.00- 7.25
Detroit, No. 1 new	7.00- 7.50
Valleys, new No. 1	11.00-11.50

MACHINE TURNINGS

Bimingham	4.50- 5.00
Boston, dealers	1.75- 2.00
Buffalo	4.00- 4.50
Chicago	5.00- 5.50
Cincinnati, dealers	4.50- 5.00
Cleveland	5.50- 6.00
Detroit	4.50- 5.00
Eastern Pa.	5.50- 6.00
New York, dealers	2.00- 2.50
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50
Valleys	7.50- 8.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	5.00- 5.50
New York, dealers	1.50- 1.75
Pittsburgh	7.25- 7.75

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Chicago	5.25- 5.75
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
E. Pa., chemical	12.00-15.00
New York, dealers	1.50- 1.75
Pittsburgh	7.25- 7.75
St. Louis	4.00- 4.25

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	6.75- 7.25
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	5.00- 5.50
St. Louis	4.00- 4.50

FORGE FLASHINGS

Boston, dealers	4.00- 4.25
Buffalo	8.50- 9.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00

FORGE SCRAP

Boston, dealers	4.00- 4.50
Chicago, heavy	10.00-10.50
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	4.00- 4.50
Buffalo	8.50- 9.00
Chicago, elec. fur.	8.50- 9.00
Cleveland	6.00- 6.50
Eastern Pa.	10.00-10.50
St. Louis	6.00- 6.25

STEEL CAR AXLES

Birmingham	10.00-10.50
Boston, ship, point.	9.00- 9.50
Buffalo	13.00 13.50
Chicago, net	10.75-11.25
Eastern Pa.	14.00-15.00
St. Louis	10.00-10.50

SHAFTING

Boston, ship point.	10.50-10.75
Eastern Pa.	15.00-15.50
New York, dealers	10.75-11.25
St. Louis	11.00-11.50

CAR WHEELS

Birmingham, iron	8.50- 9.00
Boston, iron deal.	5.75- 6.00
Buffalo, iron	12.00-12.50
Buffalo, steel	13.00-13.50
Chicago, iron	10.00-10.50
Chicago, rolled steel	10.00-10.50
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	11.50-12.00
Eastern Pa., steel	13.50-14.00
Pittsburgh, iron	11.25-11.75
Pittsburgh, steel	13.75-14.25
St. Louis, iron	7.50- 8.00
St. Louis, steel	8.00- 8.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 2	6.00
Boston, tex. con.	10.50-11.00
Buffalo, cupola	9.50-10.00
Buffalo, mach.	11.00-11.50
Chicago, agri. net	7.25- 7.75
Chicago, mach. net	8.50- 9.00
Chi., railroad net	8.00- 8.50
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	10.75-11.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	11.00-12.00
Pittsburgh, cupola	13.00-13.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	7.75- 8.25
Cleveland, break.	7.50- 8.00
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.50
N. Y., No. 1, deal.	6.50- 6.75
N. Y., break. deal.	6.50- 6.75
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	12.00-12.50
Buffalo	11.50-12.00
Chicago, R. R.	9.50-10.00
Cincinnati, agri. del.	8.00- 8.50
Cinci., R. R. del.	9.00- 9.50
Cleveland, rail	11.00-11.50
Detroit, auto	8.50- 9.00
St. Louis, R. R.	8.25- 8.75
Eastern Pa., R. R.	11.50-12.00

RAILS FOR ROLLING
5 feet and over

Birmingham	10.00-11.00
Boston, dealers	7.00- 7.25
Buffalo	12.00-12.50
Chicago	10.50-11.00
Eastern Pa.	12.00-13.00
New York, dealer	7.50- 8.00
St. Louis	9.00- 9.50

LOCOMOTIVE TIRES

Chicago (cut)	10.00-10.50
St. Louis, No. 1	9.50- 10.00

LOW PHOS. PUNCHINGS

Buffalo	13.75-14.25
Chicago	10.50-11.00
Eastern Pa.	14.50-15.00
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum: 98-99%	Antimony: Spot, N. Y.	Ingot Nickel
July 21	9.00	9.12½	8.75	51.95	52.00	3.80	3.70	4.30	*22.90	8.12½	36.00
July 23	9.00	9.12½	8.75	51.95	52.00	3.85	3.70	4.30	*22.90	8.12½	36.00
July 24	9.00	9.12½	8.75	52.15	52.20	3.85	3.70	4.30	*22.90	8.12½	36.00
July 25	9.00	9.12½	8.75	52.40	52.45	3.85	3.70	4.30	*22.90	8.12½	36.00
July 26	9.00	9.12½	8.75	52.12½	52.17½	3.85	3.70	4.30	*22.90	8.12½	36.00
July 27	9.00	9.12½	8.75	52.10	52.15	3.75	3.60	4.30	*22.90	8.12½	36.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	2.95c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	
Buffalo	1.95c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.20c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.20c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.10c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.56c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.90c
Cincinnati	4.05c
Cleveland	3.96c
Detroit	3.98½c
Los Angeles	4.35c
New York	3.85c
Philadelphia*†	3.55c
Pittsburgh**	3.60c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.14c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore *†	4.21c
Buffalo	4.00c
Boston (g)	4.55c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.30c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.70c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	
Baltimore	2.80c
Boston	4.25c
Buffalo	3.55c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore(c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland(h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	5.25c
Chicago (b)	3.45c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.56c

(b) Plus straightening, cutting and quantoty differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 26

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon.	$15.12	3 0 0	$8.04	1 13 0
Basic bessemer	13.61	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	15.25	3 0 6	.....	.....
SEMIFINISHED STEEL				
Billets	$27.72	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.31	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.06	7 15 0	$26.77	5 10 0
Merchant bars	1.69c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.66c	7 7 6	.68c	3 1 6
Plates, †¼ in. or 5 mm.	1.80c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.08c	9 5 0	1.13c to 1.16c	5 2 6 to 5 5 0
Sheets, gal., 24 gage, corr.	2.53c	11 5 0	1.43c	6 10 0
Bands and strips	1.86c	8 5 0	.88c	4 0 0
Plain wire, base	2.08c	9 5 0	1.18c	5 7 6
Galvanized wire, base	2.36c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.70c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.54	0 18 0	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$17.01	3 7 6(a)	$13.84	210	$14.48	310	$24.35	63
Basic bessemer pig iron	16.38	3 5 0(a)*	12.19	185	13.54	290	26.86 (b)	69.50
Furnace coke	4.41	0 17 6	7.91	120	5.14	110	7.34	19
Billets	27.72	5 10 0	28.34	430	20.55	440	37.30	96.50
Standard rails	1.86c	8 5 0	2.10c	700	2.31c	1,100	2.31c	132
Merchant bars	1.94c	8 12 0	1.68c	500	1.16c	550	1.93c	110
Structural shapes	1.97c	8 15 0	1.65c	550	1.16c	550	1.88c	107.50
Plates, †¼-in. or 5 mm.	1.91c	8 10 0	2.10c	700	1.47c	700	2.22c	127
Sheets, black	2.36c	10 10 0§	2.55c	850‡	1.63c	775‡	2.52c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.93c	13 0 0	4.50c	1,500	3.15c	1,500	6.48c	370
Plain wire	2.08c	9 5 0	3.39c	1,130	2.31c	1,100	3.03c	173
Bands and strips	2.10c	9 7 0	1.95c	650	1.47c	700	2.22c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 52

Pittsburgh—Small lots of merchant bars are being taken from mills every few days, largely to supplement stocks which have become unbalanced. Backlogs are being worked on for the most part although a little new business appears occasionally from unexpected quarters. Steel bars are quoted at 1.80c, Pittsburgh.

Cleveland—Steel bar tonnage booked in July is the lightest of any month so far this year. Sellers believe August will mark the turning point, with prospects for heavier buying by automobile manufacturers and miscellaneous consumers. Orders during the week were generally for less than carload lots. Forging shops in this district are operating three days a week.

Chicago—Barmakers are experiencing only light demand. Maintenance of activity on the part of the automotive industry continues the one bright spot. Demand from miscellaneous users still reflects the usual mid-summer lull. Little improvement is in sight although some sellers feel that the first signs of the anticipated fall pickup will make their appearance by the middle of August.

Boston—Commercial steel bar stocks held by consumers have not been lowered to a point to bring out much buying and orders are generally for small lots. Several larger consumers, however, are not believed to have covered much beyond early August. Soft steel bars are 2.20c, Boston.

Philadelphia—While jobber specifications are negligible, manufacturing consumers are bringing out some fair specifications for steel bars, the market on which is 1.80c, Pittsburgh, or 2.09c, Philadelphia. Common iron bars are moving slowly at 1.89c to 1.94c, Philadelphia.

Washington—Bids will be taken by the bureau of supplies and accounts, navy department, for 1500 pounds of hexagon and 30,600 pounds of round, grade one, 8 to 12-foot, corrosion resisting steel bars. Bids will be taken Aug. 3 for 16,250 pounds of various sizes, class one, round bar carbon tool steel; for 19,150 pounds of class one, 6 to 12-foot lengths, tungsten high-speed tool steel; for 7520 pounds of class one, polished round drill rod tool steel; for 13,000 of octagon, 23,600 pounds of round and 5000 pounds of square class three, 6 to 12-foot lengths carbon tool steel; and 1000 pounds of class four, square carbon tool steel.

Plates

Plate Prices, Page 52

Pittsburgh—Current activity in the steel plate trade here embraces only small tonnages for designated jobs of miscellaneous character. Producers have received no especially large inquiries in the past week. Plates are quoted at 1.80c, Pittsburgh.

Cleveland—Principal demand for plates is coming from railroads and tank fabricators, enabling the local plate mills to continue operations last week on a slow schedule. The general volume of business is small, some sellers estimating it at about one-tenth of normal. Some plates have been purchased by marine boiler constructors for Great Lakes and Ohio river vessels, mainly replacements. Considerable miscellaneous inquiry indicates that users of fabricated plate products are figuring on more work.

Award of 1200 tons of plates for tank tops for Cleveland's easterly sewage disposal plant to the Cleveland plate mill is expected this week. This project, pending for several months, also takes 2500 tons of concrete bars and 400 tons of shapes, for which tentative awards have been made.

Chicago—New business in plates is confined mainly to small lots. No inquiries involving tonnage are pending. Little demand from tank and pipe line builders is in immediate prospect although some work is pending. Outlook for a general increase in buying by railroad equipment makers is somewhat clouded.

New York—Last-minute changes in specifications have caused most shipyards figuring on navy boats to postpone the deadline on plate prices until the week of July 30. Oil companies have placed a few tank jobs and the lighthouse bureau, Staten Island, N. Y., is taking bids on 12 large buoys. Plans are nearing completion for some tanker tonnage.

Philadelphia—Plate tonnage is light, except for requirements of the navy boats on which construction bids will be opened Aug. 15. Two yards in this district are figuring, New York Shipbuilding Corp., Camden, N. J., and Sun Shipbuilding & Dry Dock Co., Chester, Pa., the latter understood to be confining its estimates to submarines. Railroad work is negligible and includes a small tonnage for the 28 locomotives for the Pennsylvania railroad, placed in 1931, but only now being released. The market is 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

Contracts Placed

1200 tons, eight tanks, marine oil terminal, Tidewater Oil Co., Boston Harbor-Chelsea river, to McClintic-Marshall Corp., Bethlehem, Pa.

1000 tons, Green River pipe line, Tacoma, Wash., 52 to 63-inch pipe, to Birchfield Boiler Co., Tacoma, Wash.

750 tons, mostly tank and boiler work, for Solvay Process Co., New York, plant at Baton Rouge, La., to Chattanooga Boiler & Tank Co., Chattanooga, Tenn.

225 tons, tank, Shell Eastern Products Inc., Tonawanda, N. Y., to Chicago Bridge & Iron Works, Chicago.

175 tons, tanks, Colgate-Palmolive-Peet Co., Jersey City, N. J., to Chicago Bridge & Iron Works, Chicago.

150 tons, tanks for bulk plant for Standard Oil Co. of New Jersey, Oceanside, N. Y., to Chicago Bridge & Iron Works, Chicago; no new tanks will be required for a bulk oil terminal for Sstandard Oil at Kreischerville, Staten Island, as containers are being installed from other plants.

100 tons, two tanks for Hamilton Field, Calif., to unnamed interest.

100 tons, 200,000-gallon tank on 100-foot tower, Sandstone, Va., to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage, steel water tank, South Jamaica, N. Y., to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage, 150,000-gallon elevated tank, Guthrie, Ky., to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa. Same fabricator also awarded tank and tower for Virginia, Minn., at $8200.

Unstated tonnage, water tank, Parsons, Tenn., to Chicago Bridge & Iron Works, Chicago, $8450.

Contracts Pending

1025 tons, gates for Parker dam, Nevada; bids opened.

150 tons, lighthouse tender JASMINE, Dravo Contracting Co., Pittsburgh, low; bids at Washington bureau, July 23.

125 tons, 24-inch pipe, Lemon Grove and Spring Valley irrigation district, La Mesa, Calif.; bids opened.

100 tons, four 100-horsepower locomotive boilers for government dam at Fort Peck, Mont.; bids opened.

Unstated tonnage, 150,000-gallon elevated water tank, state prison colony, Norfolk, Mass.; bids July 31.

Sheets

Sheet Prices, Page 52

Pittsburgh—Some fair-size tonnage releases for automobile sheets came out during the week. Releases by Ford Motor Co. indicate the approach of some change, though it is not believed to involve a radical departure in model. Some miscellaneous sheet business is being taken by the mills. The base price on No. 24 gage hot-rolled anealed sheets is 2.40c and on No. 24 gage hot-rolled

pickled in the breakdown 2.80c, Pittsburgh.

Cleveland—Renewed buying by automobile manufacturers is expected about the middle of August, some inquiries already having been received here. Meanwhile, they are placing moderate size orders for prompt shipment to round out their stocks, which are being absorbed at a much faster rate than anticipated. Consumption by manufacturers of household utilities here is slowing, although the General Electric Co. has booked a large order for refrigerators which will keep its Erie, Pa., plant operating at capacity for the remainder of the year. No contracting of importance has developed from any source. Youngstown Sheet & Tube Co., Youngstown, O., has been awarded 176 tons of galvanized corrugated roofing sheets for Panama, at $13,720.43, delivered.

Chicago—Automobile builders continue to furnish some business for sheet makers but demand in general is quiet. No sustained improvement is looked for until September. No. 24 gage hot-rolled annealed sheets now are 2.50c, Gary, Ind.

American Sheet & Tin Plate Co., Pittsburgh, has been awarded 68,000 pounds of No. 24 black sheets, for the Jeffersonville, Ind., quartermaster depot at 2.78c, delivered, bids July 16. All bidders quoted the same price.

Boston — Large consumers of sheets and jobbers, still with sizable stocks, are not buying, and orders are mainly for small miscellaneous lots. This volume, however, shows slight improvement.

New York — Continued good demand is noted for sheets from manufacturers of mechanical refrigerators, for new low price lines. Generally, buying is less active than a week ago.

Philadelphia—Except for slightly better specifications from stovemakers and prospects for substantial buying shortly for radio manufacture, the sheet situation is less promising than a week ago. Consumers manifest uncertainty with regard to the price trend and are moving cautiously. This has restricted spot buying in some quarters.

Buffalo—Sheet production here continues at 30 per cent or less. Inquiry is lacking. Many consumers are believed to be covered for the entire quarter.

Cincinnati—Demand for sheets, equal to about 30 per cent of mill capacity in this district, is being sustained principally by orders for automobile production.

Railroads

Track Material Prices, Page 53

Release of orders recently by the Pennsylvania for 28 electric locomotives will result shortly in the placing of some steel, although nothing like the quantity of rolled steel will be involved were the locomotives to be steam propelled. The rolled steel consumption is further reduced by the fact that the cabs will be constructed of sheet aluminum. The castings, including bed frames, in fact, will constitute the major portion of the steel required. A small tonnage of plates, angles and other items will be of rolled steel.

These orders were originally placed in 1931 and later held up. Even the steel was tentatively placed at that time. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was awarded 12, with assembly to be done by the Baldwin Locomotive Works at Eddystone, Pa.; the Altoona shops of the Pennsylvania 11, and the General Electric Co., Schenectady, N. Y., five.

An eastern railroad is said to be considering the building of 2500 to 3000 hopper cars.

Early award is expected on rails and accessories for the board of transportation, New York. On the 6070 gross tons of standard rails, 381 tons of guard rails, 200,000 tie plates and on a portion of frogs and switches, Bethlehem Steel Co., Bethlehem, Pa., appears low; on 100,000 pieces of bolts, Republic Steel Corp., Youngstown, O., and on 425 tons of miscellaneous spikes, the Oliver Iron & Steel Co., Pittsburgh. This proposition was up about a year ago, but was postponed with all bids thrown out. The board of transportation has recommended awards to the above companies on these bids.

Illinois Central is inquiring for a six-car streamlined train, one car to be motorized and the remainder for mail, baggage and passenger service.

Rail mills are practically at the end of their backlogs and little new rail business is in sight. Some track fastenings are being taken, but in small lots.

Car Orders Placed

Norfolk Southern, two gasoline rail motor cars, to American Car & Foundry Co., New York, with an option on two additional cars.

Uruguayan State Railways, four rail motor cars, to J. G. Brill Co., Philadelphia.

Locomotives Placed

Pennsylvania, 28 electric locomotives, released against orders placed in 1931, 12 going to Westinghouse Electric & Mfg. Co., with assembly by Baldwin Locomotive Works, Eddystone, Pa.; 11 to Altoona, Pa., shops of the Pennsylvania; five to General Electric Co., Schenectady, N. Y.; cabs on these locomotives will be of sheet aluminum; release of these orders was noted in last week's issue.

Car Orders Pending

Illinois Central, six streamlined cars, one rail motor car, one combination baggage, mail and express car, one combination smoker and coach, one coach, one cafe lounge car and one parlor observation car.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 53

Bolts, nuts and rivets are in light demand and at Cleveland new business is at about 35 per cent below the June volume. Automobile builders are the best buyers, with jobbers, railroads, agricultural implement builders and miscellaneous users in that order. Chicago suppliers find little business except for filling in stocks. Railroad car shops and equipment builders are taking little tonnage. Agricultural implement makers are also light buyers. Prices are unchanged.

Cold Finished

Cold Finished Prices, Page 53

Pittsburgh — Automotive parts makers continue to take most of the cold-finished bars being produced. Spark plug makers at the moment are not so active as are some other lines, and shafting drawers are fairly well provided with material for the present. Cold-finished carbon steel bars are steady at 2.10c base, Pittsburgh, and cold-drawn bars of alloy quality are bringing 2.95c, Pittsburgh.

Tin Plate

Tin Plate Prices, Page 52

Pittsburgh—A heavy food pack is expected by canning interests, and is already maturing in the case of tomatoes. Tin plate mills are operating at the usual summer season rates and shipments continue to go forward in fairly steady tonnages.

Quicksilver

New York—Quicksilver prices are unchanged here in a dull market. Small lots are quoted $75.50, a virgin flask of 76 pounds, and round lots down to $74.50 a flask.

Shapes

Structural Shape Prices, Page 52

Cleveland—The Fisher Body Co. of Cleveland has awarded 600 tons of shapes for an addition to its stamping department to a Pittsburgh district fabricator. Included in other awards on which fabricators here figured are 925 tons for a press building for the Briggs Mfg. Co., Detroit, and 450 tons for a postoffice at Jamestown, N. Y. The Ford Motor Co. will require 3500 tons for new mill buildings at Dearborn, Mich., in addition to the 3900 tons for mill buildings it recently distributed to two fabricators. It is possible that some buildings at Highland Park will be taken down and re-erected at Dearborn .

Pittsburgh—A considerable number of awards for highway bridges combined last week to furnish some fairly substantial structurel tonnages. Some new work came out for figures, including 175 tons for alterations to the White House at Washington. Plain structural shapes are 1.85c, Pittsburgh, and piling 2.15c.

Chicago — Government projects furnish chief interest in the structural markets. Dams Nos. 5A and 6 across the Mississippi river will require 3000 tons of shapes each in addition to 2000 tons of sheet piling and 500 tons of concrete bars. About 5500 tons of shapes will be required for bridges in Missouri, 1400 tons for several in Montana and a smaller tonnage for Illinois projects. The PWA loan of $6,877,000 recently granted for the Chicago outer drive bridge has been withdrawn due to improper credit.

Boston — Award of the contract for the railroad lift bridge, Cape Code canal, Buzzards Bay, Mass., on which Phoenix Bridge Co., Phoenixville, Pa., is low, still pends. The bids were above the engineer's estimate, but within the appropriation. Structural inquiry is slightly heavier, including a 725-ton bridge, Enfield, Me.

New York—A growing volume of structural requirements is developing in this district, mainly for public work. Awards include a bridge at Albany, N. Y. for the New York Central railroad, 750 tons. The Elmira, N. Y. fabricating works of the American Bridge Co. has resumed operations after a long suspension.

Structural steel bookings in June exceeded the high point of last year reached in April, and established a new high point since the low of the depression last year, according to the American Institute of Steel Construction. Reports from 83 per cent of the industry indicate June bookings amounted to 84,116 tons; shipments 66,288 tons. One hundred and three companies reporting have 307,729 tons on hand for future fabrication.

Philadelphia—Although little new tonnage is being entered, shape schedules are being fairly well maintained by virtue of continued releases against identified projects awarded prior to June 15. Fabricators in this district are figuring on a 5000-ton state viaduct in Baltimore, on which bids are to be opened Aug. 10, and an eastern Pennsylvania fabricator, the Phoenix Bridge Co., may get 4000 tons for the Cape Cod bridge, on which the company is low. A few hundred tons are involved in Pennsylvania state work, on which general contractors' bids were opened July 27. The market is 1.90c, Bethlehem, or 2.00½c, Philadelphia.

Shape Contracts Placed

1100 tons, lookout towers, forestry division, department of agriculture, Washington, to McClintic-Marshall Corp., Bethlehem, Pa., for delivery to various points.

1100 tons, bridge at Lamont, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

950 tons, viaduct, New York Central railroad, Central avenue, Albany, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

925 tons, press building for Briggs Mfg. Co., Detroit, to Whitehead & Kales Co., Detroit.

600 tons, building for Fisher Body Co., Cleveland, to Jones & Laughlin Steel Corp., Pittsburgh.

450 tons, high school, Jamestown, N. Y., to McClintic-Marshall Corp.; J. W. Cowper Co. Inc., general contractor.

410 tons, warehouse, Pittsburgh, for United States bureau of mines, to McClintic-Marshall Corp., Bethlehem, Pa.

320 tons, shed No. 4, port commission, Albany, N. Y., to Leach Steel Corp., Buffalo.

250 tons, state highway bridge, Philadelphia, to Phoenix Bridge Co., Phoenixville, Pa.

225 tons, bridge, NRH 107-E, Noxubee county, Mississippi, to Ingalls Iron Works Co., Birmingham.

220 tons, New Jersey state highway commission bridge at Three Rivers, N. J., to American Bridge Co., Pittsburgh.

210 tons, Thornton Hall, University of Virginia, Charlottesville, Va., to Carolina Steel & Iron Co., Greensboro, N. C.; North-Eastern Construction Co., Baltimore, general contractor.

205 tons, municipal building, Dover, N. H., to New England Structural Co., Everett, Mass.

205 tons, bridge for Southern Pacific railroad, Gaviota, Calif., to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, bridge for Southern Pacific railroad, Lento, Calif., to McClintic-Marshall Co., Bethelehem, Pa.

200 tons, state highway bridge, Benson, Nebr., to Omaha Steel Works, Omaha.

200 tons, highway bridge at Conway, S. C., for United States Engineering Corp., to Virginia Bridge & Iron Co., Roanoke, Va.

180 tons, highway bridge, Red Cliffs, Colo., for United States department of agriculture, to Kansas City Structural Steel Co., Kansas City, Mo.

180 tons, high school building at New Bedford, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, bridge, MP 226.01, Lansing, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

170 tons, mess hall, Washington, to Lehigh Structural Steel Co., Allentown, Pa.

160 tons, towers, Fort Peck, Mont., dam, to Hansell-Elcock Co., Chicago.

160 tons, bridge for Grand Trunk Western railroad, Lansing, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

150 tons, bridge 139-B, Coahoma county, Mississippi, to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, including 80 tons of sheet piling for bulk station of Standard Oil Co. of New Jersey, Atlantic City, N. J., awarded through the Eastern Engineering Co., Atlantic City, to the Kalman Steel Corp., Bethlehem, Pa., and 70 tons for the York county bridge, Pennsylvania, to the McClintic-Marshall Corp., Bethlehem, Pa.

145 tons, state garage, Ravenna, O., to Fort Pitt Bridge Works, Pittsburgh.

140 tons, three beam spans for Reading Co., at Donaldson, Allison and Cressona, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

120 tons, alterations to Union high school, Inglewood, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

120 tons, state bridge, route No. 14, near Ravenna, O., to Fort Pitt Bridge Works, Pittsburgh.

100 tons or more, shapes and bars, laboratories and greenhouses, department of agriculture, Beltsville, Md., to Dietrich Bros. and American Steel Engineering Co., Baltimore; North-Eastern Construction Co., Baltimore, general contractor.

Shape Awards Compared

	Tons
Week ended July 28	**19,620**
Week ended July 21	**9,363**
Week ended July 14	**33,023**
This week in 1933	**24,575**
Weekly average for 1933	**15,413**
Weekly average, 1934	**17,360**
Weekly average, June	**18,040**
Total to date, 1933	**466,109**
Total to date, 1934	**538,153**

Shape Contracts Pending

5000 tons, state viaduct, Orleans street, Baltimore, bids opened Aug. 10; Harry D. Williar Jr., chief engineer.

3500 tons, pier 32, department of docks, New York; specifications out.

3000 tons, dam No. 5A, Winona, Minn.; bids Aug. 18 to United States engineers, St. Paul.

3000 tons, dam No. 6, Trempealeau, Wis.; bids Aug. 18 to United States engineers, St. Paul.

2800 tons, toll bridge at Hannibal, Mo.

2500 tons, toll bridge, Washington, Mo.

2000 tons, toll bridge, from Buchanan

county, Missouri, to Atchison county, Kansas.
1400 tons, three state highway bridges, Montana.
1025 tons, spillway gates, Parker dam, Nev.; bids opened.
1000 tons, inspection shed, board of transportation, New York; William Kennedy Construction Co., Brooklyn, low for general contract.
850 tons, wharf and transit shed, Stockton, Calif.; bids returned unopened on account of strike situation and new bids will be called for soon.
740 tons, state bridge at East Fifty-ninth street, Chicago.
725 tons, state highway bridge, Enfield-Howland, Me.
700 tons, postoffice, Bingham, N. Y.; Coath & Goss, Chicago, awarded general contract.
650 tons, state highway bridge, Newport, Ky.
450 tons, Anacostia Junior high school, Washington; bids July 31 to District of Columbia commissioners.
354 tons, Big Timber creek bridge, Westville-Brooklawn, N. J.; F. H. Cannuso Co., Philadelphia, low for general contract.
310 tons, high school at Bismarck, N. Dak.
200 tons, armory sheds, Natick, Mass., to Phoenix Bridge Co., Phoenixville, Pa.
175 tons, students' residence, University of Montana, Missoula, Mont.
175 tons, alterations, White House offices, Washington.
106 tons, state bridge, Kern county, California; bids opened.
105 tons, immigration station, Nogales, Ariz.; Robert E. McKee, El Paso, Tex., low for general contract.

Reinforcing

Reinforcing Bar Prices, Page 53

San Francisco—Featuring the market here is the award of 5500 tons of concrete bars for Boulder dam, Boulder, Nev., on proposal No. 23, 140-A. This was divided equally between Judson Mfg. Co., Oakland, Calif., and Sheffield Steel Corp., Kansas City, Mo.

Pittsburgh — Rehabilitation of whiskey distilleries in this district is calling for a number of small lots of reinforcing bars. The A. Overholt distillery at Broadford, Pa., has placed 140 tons. Cut lengths of reinforcing bars are 2.05c, Pittsburgh, or 1.85c to jobbers.

Cleveland—A ruling has been issued by the steel code authority that quantity extras on reinforcing bars shall apply to the total weight of an order regardless of grades. Quantity extras are the same for new billet steel as rail steel bars. In addition to 400 tons of concrete bars for Ohio state road work, award of which is expected shortly, some northern Ohio cities are taking bids on small lots, including 60 tons for East Cleveland, O.

Chicago—Current reinforcing bar business pending is largely for government projects. Two dams across the Mississippi river will require about 1000 tons on which bids will be taken Aug. 18. Rebuilding of the Chicago stockyards and an addition to the Chicago Tribune building comprise the only important private business now in sight.

Boston—New inquiry for reinforcing steel bars is largely for bridges with a scattering of small lots for public works. Three small reinforced concrete bridges close this week for Rhode Island, taking a fair tonnage. Most highway requirements have been placed.

New York—Concrete reinforcing bars awards are light, but include 205 tons for a distillery building at Linden, N. J. New inquiry is dull, but a fair volume pends on which bids are in. Queens approach piers, Tri-Boro bridge, New York, will take 305 tons.

Philadelphia — Dullness continues in reinforcing bars, the only outstanding project involving 475 tons. This is the previously noted Pennsylvania state bridge project, on which contractors' bids were opened July 27. Billet steel bars, cut lengths, are unchanged at 2.05c, Pittsburgh, or 2.34c, Philadelphia.

Reinforcing Steel Awards

5500 tons, proposal 23140-A, Boulder dam, Boulder City, Nev., to Judson Mfg. Co., Oakland, Calif., 2750 tons, and to Sheffield Steel Corp., Kansas City, Mo., 2750 tons.
650 tons, noncorrosive reinforcing fabric for United States engineer, Memphis, Tenn., to Copperweld Steel Co., Glassport, Pa.
205 tons, distillery buildings, Distillers Co. Inc., Linden, N. J., to Jones & Laughlin Steel Corp., Pittsburgh; Turner Construction Co., general contractor.
150 tons, mesh, highway, Northampton county, Pennsylvania, to American Steel & Wire Co., Pittsburgh.
150 tons, court house, Visalia, Calif., to W. C. Hauck & Co., San Francisco.
103 tons, two bridges over Central railroad of New Jersey and Lehigh Valley railroad, near Three Bridges, Hunterdon county, New Jersey, to Kalman Steel Corp., Bethlehem, Pa.; Tidewater Construction Co., general contractor.

Concrete Awards Compared

	Tons
Week ended July 28	6,758
Week ended July 21	502
Week ended July 14	3,323
This week in 1933	10,825
Weekly average for 1933	3,771
Weekly average, 1934	4,582
Weekly average, June	4,816
Total to date, 1933	104,571
Total to date, 1934	142,036

Reinforcing Steel Pending

1100 tons, addition to market, Bronx, N. Y.; bids in.
800 tons, Orleans street viaduct, Baltimore; bids Aug. 10 to state roads commission, Baltimore.
750 tons, wharf and transit shed, Stockton, Calif.; bids returned unopened on account of strike situation and new bids will be called for soon.
545 tons, noncorrosive wire fabric, flood control work, United States engineer, Vicksburg, Miss.; bids Aug. 1.
500 tons, dam No. 5A at Winona, Minn.; bids to United States engineers, St. Paul, Aug. 18.
500 tons, dam No. 6 at Trempealeau, Wis.; United States engineer, St. Paul, will take bids Aug. 18.
350 tons, buildings, state hospital for nervous diseases, Benton, Ark.; Nathan Wholfeld, Dallas, Tex., general contractor.
305 tons, Queens approach piers, Triboro bridge, New York; bids in Aug. 2.
300 tons, proposal 23207, Boulder dam, Boulder City, Nev.; bids opened.
160 tons, section No. 4, New York Central railroad project, West-side, Manhattan, N. Y.
157 tons, state highway work in Kern county, California; bids opened.
137 tons, Big Timber creek bridge, Westville-Brooklawn, N. J.; F. H. Cannuso Co., Philadelphia, low for general contract.
100 tons, high school, Lake Forest, Ill.
Unstated tonnage, addition to Chicago Tribune building, Chicago.

Pipe

Pipe Prices, Page 53

Pittsburgh—While generally line pipe inquiry is extremely limited, occasional small lots continue to be placed. Merchant pipe needs apparently have been taken care of and even jobbers appear satisfied although a few orders are being received for stock filling-in purposes. The public works program, upon which hang prospects for larger pipe buying in the fall, appears slow to mature.

Cleveland—Prices of rigid electrical conduit have been advanced, an average of $8 a ton for third quarter, effective July 25. The market for tubular products is quiet.

Chicago—United States Pipe & Foundry Co., Burlington, N. J., and Glamorgan Pipe & Foundry Co., Lynchburg, Va., were low bidders on 2228 tons of 4 to 16-inch cast iron water pipe for the city of Chicago. Bids closed July 25 on 150 tons of castings for 30 to 54-inch water pipe, also for Chicago.

Boston—Cast pipe buying is light, as are releases against old orders. Small fill-in volume is fair. New

Bedford, Mass., has bids on a small tonnage of pipe and fittings. Steel pipe has been more active for building construction and Boston water lines, but has slowed up during the last week.

New York—Cast pipe buying is sluggish with eastern foundries generally operating on lower schedules as backlogs are exhausted with a small volume of new orders reaching the foundries. Wells, N. Y., has bids on several hundred tons. Buying by the FERA, active until recently, has slumped. Navy department, bureau of supplies and accounts, took bids July 20 on several hundred tons of welded steel and iron pipe on which bidders quoted substantially the same figures, delivery to east and west yards.

Birmingham, Ala.—Pipe awards are slow and scattered, total production being light. Several hundred men employed at the Holt plant of the Central Foundry Co. went out on strike the past week, demanding higher wages, shorter hours and recognition of union. Management announced that the plant would be shut down until the men desired to return to work.

Cast Pipe Placed

410 tons, Bethlehem, N. H., to R. D. Wood & Co., Florence, N. J.
325 tons, Stowe, Vt., to Warren Foundry & Pipe Co., Everett, Mass.

Steel Pipe Placed

1575 tons, 48-inch line, West Roxbury district, Boston, to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.; this in addition to 1305 tons recently placed with same fabricator by the C. & R. Construction Co., Roslindale, Mass.
350 tons, 65 sections, pontoon pipe, United States engineer, Vicksburg, Miss., to Midland Barge Co., Midland, Pa.
Unstated tonnage, pontoon dredge pipe, United States engineer, Jacksonville, Fla., to Chicago Bridge & Iron Works, Chicago; $3847.10, f.o.b. Birmingham, Ala.

Cast Pipe Pending

2228 tons, water line, Chicago; United States Pipe & Foundry Co., Burlington, N. J., and Glamorgan Pipe & Foundry Co., Lynchburg, Va., low bidders on various sizes.
850 tons, 10-inch and under, class 150, Georgetown, Mass.; bids in.
594 tons, 16-inch, class 150, Gilroy, Calif.; bids in.
500 tons, 8 to 16-inch, class G and H, high-pressure line, San Francisco; bids opened.
428 tons, 4 to 10-inch, class 150, Fallon, Nev.; bids rejected and new bids will be called for.
404 tons, San Clemente, Calif.; bids soon.
375 tons, 20-inch, class B, Keene, N. H.
200 tons, 6, 8 and 12-inch, Bremerton,

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Wash.; United States Pipe & Foundry Co., Burlington, N. J., low.
168 tons, 6 and 10-inch, class 150, South Pasadena, Calif.; bids soon.
150 tons, sewer, Walter E. Fernald state school, Waverly, Mass.; bids in.
148 tons, 4 and 6-inch, class 150, Santa Monica, Calif.; bids opened.

Steel Pipe Pending

900 tons, 30-inch, for completion of Still Creek dam, Panther Valley Water Co., Lansford, Pa.; bids asked.

Strip Steel

Strip Prices, Page 53

Pittsburgh — Users of narrow width strip continue to buy for immediate needs, largely in specified tonnages, but additional wide strip releases are coming from automotive partsmakers a little more freely this week. This gives promise of somewhat better production in some instances for next week. Hot-rolled strip is 1.85c base, Pittsburgh, and cold-rolled 2.60c base, Pittsburgh.

Cleveland—Demand for strip steel for building construction purposes shows some improvement, due mainly to public work. In other directions sales during the week were limited to a few carloads for prompt shipment. Contracting is conspicuously lacking. Producers, however, expect a considerable increase in tonnage from automobile manufacturers in August.

Chicago—Prospects for stripmakers are definitely better for September and possibly late August. Demand from the automotive trade leads but miscellaneous users are only light takers.

Boston—Strip mill operations are at a low rate as demand continues light. With a number of mills strip is even less active than wire. Consumers appear to be well stocked and considerable confusion as to prices exists among buyers. Cold-rolled strip is unchanged at 2.80c, Worcester, Mass.

Philadelphia—Although prices are unchanged at 2.14c, Philadelphia, for hot-rolled and 2.89c for cold-rolled, strip buyers, regarding the situation as unstable and in many cases feeling no urgent need for material, are specifying slowly.

Semifinished

Semifinished Prices, Page 53

A little increase in specifications for sheet bars in small tonnages within the past several days leads to the belief that more sheet mills are resuming. The increase is thought likely to continue and further releases are expected in early August. Sheet bars are $28; forging billets $32; standard billets $27; and alloy steel billets $39, base, Pittsburgh.

Wire

Wire Prices, Page 53

Pittsburgh — Demand for wire products continues rather sporadic and the volume of wire products moving from mill to consumer is along the normal summer lines. Sales of fence wire continue in about normal proportions for this time of year. Shipments generally are as satisfactory as probably any other finished steel line. Plain wire to the manufacturing trade is quoted at 2.30c for six to nine gage; standard wire nails at $2.60; galvanized nails, 16 gage and coarser, 4.60c base, Pittsburgh.

Cleveland—Little improvement is expected to develop in the market for several weeks when purchasing for automobile manufacturers' requirements is likely to be resumed. Jobbers are well supplied. Despite the drouth producers look forward to a fairly strong demand this fall from agricultural areas. Sales generally during the week were in less than carload lots.

Chicago—Wire producers are booking little business at present but view the fall period optimistically. It is felt that some increase in sales will be noticeable by mid-August. Wire products are moving slowly to farm areas but some gain is regarded likely within the next few weeks. Reichman-Crosby Co., Memphis, Tenn., has been awarded 450 tons of 7/16-inch steel wire strand for the United States engineer, Memphis, at 3.88c, f.o.b. cars, contractors' plant. Engineer at Vicksburg, Miss., closes Aug. 1 on 500,000 feet noncorrosive three-wire strand. Page Steel & Wire Co., Monessen, Pa., has been awarded 100 miles of W-75 wire for the signal corps, Chicago.

Boston—Rods for the 2885 tons of wire for the main cables, Hell Gate section, Tri-Boro bridge, New York, will be produced at the Worcester plant of the American Steel & Wire Co. With suspenders, wrapping and other wires, close to 3000 tons will be required. Meanwhile demand for wire products, including most specialties, is light with plain bright wire to the manufacturing trade unchanged at 2.40c, Worcester, Mass.

Philadelphia—Although manufacturers are specifying more freely than jobbers, the situation in wire products continues to reflect the substantial releases of last month. Prices are steady.

Pig Iron

Pig Iron Prices, Page 54

Pittsburgh—With gray iron and malleable foundries generally continuing to operate at sharply reduced rates, pig iron shipments maintain their small tonnage characteristic. New buying is at a minimum and no change in the situation seems apparent at this time for at least a month or six weeks. Prices are steady.

Cleveland—Heavy stocks at foundries and a reduction in consumption, due in a number of instances to the recent excessive heat, lead producers to believe no buying of importance will develop until late in August. Current sales are comprised entirely of occasional carload lots.

Chicago—Shipments during July to date show a sharp reduction but this was not unexpected in view of the heavy tonnage moved in June. Activity in automotive foundries has been a supporting factor. Operations in malleable foundries have been relatively better than in gray iron. Foundry operations at present are estimated at 35 per cent of capacity. Some improvement is reported in spot pig iron sales.

Boston—Several pig iron consumers who placed their contracts late in the second quarter are taking limited shipments, but new buying for this quarter is light. Foundry operations are sluggish, notably with some of the larger melters. A small volume of business in foreign iron is reported at shaded prices.

New York—Living up to advance notices, July has been a profoundly dull month in pig iron. This reflects the heavy specifications in June, the heaviest this year, in fact, and the reduced rate in melting so far this month. Reports of substantial offerings of Russian pig iron appear unconfirmed.

Navy department, bureau of supplies and accounts, Washington, closes Aug. 17 on 400 tons of foundry pig iron for delivery at Brooklyn, N. Y., Mare Island, Calif., and Puget Sound, Wash., yards.

Philadelphia—Pig iron specifications continue negligible, sellers noting no improvement since dullness set in the first of the month. Producers, in fact look for little increase before the middle of August. Prices are unchanged.

Buffalo—Some interest is noted in pig iron and buying is believed

to be in prospect. Gray iron foundries are slowing up production, however, and June purchases of many consumers will last them until September or later. Four furnaces continue in production—two steelworks and two merchants.

Cincinnati—Sales of pig iron are limited to small, spot orders. Shipments likewise are at a low point for the year. Stocks of some melters are not excessive and furnace interests expect revival of purchasing during August. The melt is off from the June mark, but holding better than anticipated, partly due to automotive demand. Pig iron prices, both northern and southern, are steady.

St. Louis—Record breaking heat is having an adverse effect on the melt of pig iron in the district. A district steel mill closed down over the Fourth of July, again is operating two furnaces. Business with the jobbing foundries is reported as showing some improvement, although there has been a decline in operations in stove foundries.

Birmingham, Ala.—Shipments of pig iron are considerably under production and further report is to the effect that curtailment of production will be effected by the middle of the week. Melters are buying iron against probable needs only.

Toronto, Ont.—Merchant pig iron sales have dropped to a minimum rate with melters showing no interest in the market. Melters are not taking iron except when supplies are required for immediate needs. Production, however, is sustained with three stacks blowing. Prices are firm and unchanged.

Scrap

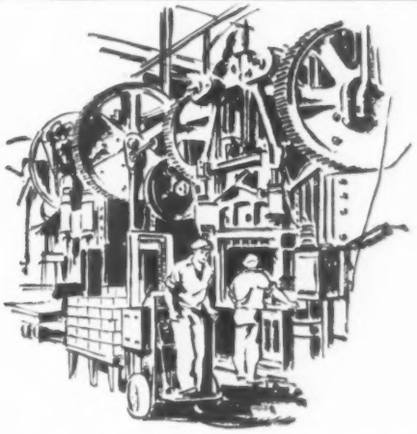
Scrap Prices, Page 55

Pittsburgh—Little scrap is being bought because of the restricted steel mill and foundry operating rates. In fact, the movement of scrap to consumer interest has been cut to the minimum and the market is as dull now as at any time this year. Inquiries are few and not important. Prices remain unchanged but there appears a weakening tendency which shifts the center of market interest to probable developments out of the next big scrap purchase.

Cleveland—Quiet continues in steel and iron scrap with only small deliveries of miscellaneous lots. Sellers are slow to dispose of their material at present prices and melters are not interested.

Chicago—Steelworks show little interest in scrap requirements and quotations in the meantime remain nominally unchanged. A slightly stronger undertone is apparent. Railroad steel on lists just closed went at $10 to $10.35 a ton. These prices are somewhat above the present consumer market. Scrap supplies in the hands of dealers are not heavy and accumulations are being further checked by a strike of wagon dealers. It is regarded unlikely that steel mills would find it possible to purchase material at present quoted levels. Foundry scrap is dull, with prices largely nominal.

Boston—Activity in scrap is largely for export, heavy melting steel grades commanding better dealer prices at dock than for domestic delivery. Demand for New England delivery is light, although the Worcester, Mass., consumer is taking light shipments of No. 1 at $7.50 delivered, No. 2 at $6.75, and skeleton at $6, the latter price being 50 cents



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higher than that recently paid. Cast grades are dull.

New York—Eastern steel mills are taking little scrap from this district. Dealers are confining their buying largely for export paying unchanged prices for heavy melting steel. One buyer for export estimates more than 90 per cent of the business is now for barge loading. Prices are generally unchanged, although skeleton and No. 1 railroad wrought and cast grades delivered to nearby foundries are lower.

Philadelphia—No. 1 heavy melting steel has settled to a flat $10, delivered, on the purchase of a round tonnage by a Claymont, Del., consumer. Railroad wrought has declined nominally to the same figure, but all other grades are unchanged, with No. 2 heavy melting steel holding at $8 to $9, delivered. General buying is exceedingly dull.

Buffalo—Dealers are buying scrap with caution because of the lack of a market and the probability of having to hold tonnage for some time. This has caused some weakness although there is no actual basis on which to figure what consumers would have to pay for a tonnage. Dealers report less scrap moving to Buffalo from the seaboard on account of an improved demand for export. Prices are nominal.

Detroit—A weak situation concontinues, with neither consumers nor dealers in the market, but quotations are unchanged in the absence of any ability by dealers to purchase below the market. Offerings by automobile manufacturers are tapering, but are strong considering the season.

Cincinnati—The iron and steel scrap market here is inactive. Mills show no indication of early contracting, and rejections are more frequent, with some major interests continuing embargoes on all shipments. Prices are unchanged and weak in absence of active demand. However, dealers are holding scrap firmly.

St. Louis—The only activity in iron and steel scrap is the purchase of a small tonnage of heavy melting steel by an Illinois melter. Prices are nominal, with only a few readjustments. Heavy melting steel, Granite City, Ill., has gone 25 cents lower while heavy melting steel has been made higher by 50 cents a ton, at Federal, Ill.

Birmingham, Ala.—Trading in steel and iron scrap is practically at a standstill and only small tonnages are moving. Steel mills are out of the market and blast furnace scrap is in no demand. Prices are nominal.

Toronto, Ont.—Consumers of iron and steel scrap show little interest and are taking only necessary supplies. Heavy melting steel and turnings are being taken by the Hamilton mills in small quantity. Foundry demand also slumped during the past few days and it is stated that there recently has been minor curtailment in operations.

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Warehouse

Warehouse Prices, Page 56

Cleveland—Volume has held fairly steady for two consecutive weeks, although some sellers note a recent slight improvement in the number of orders. Business so far this year shows a substantial gain over the same period last year.

Chicago—Incoming business is in better volume than had been anticipated. The slight decline now being encountered is regarded as no more than seasonal. No further price changes have developed following the revisions in rivets and washers last week.

Boston—Demand for warehouse steel continues sluggish, a few jobbers noting a slight upward trend a few days last week.

New York—A slight increase in warehouse volume developed last week. Considerable inquiry has come out. Prices are unchanged although some shading has been done on bolts and nuts.

Philadelphia—Following the lead of mills, jobbers here have reduced black sheets $1 a ton, to 3.55c. This is the second drop this month. Demand is under the June rate, but not as dull as generally expected.

Detroit—Warehouse business in iron and steel in July was lower than that of June only by the usual seasonal margin. Delay in release of die and tool programs or 1935 automobile models is a handicap to the warehouses. Prices are unchanged.

Cincinnati—Demand for steel from warehouse is sustained fairly well despite seasonal influences. Some slackening in purchases of sheets is noted, with structural materials dull. Prices are unchanged.

Metallurgical Coke

Coke Prices, Page 53

Coke consumers show little interest in the market and shipments are limited to actual requirements, both of furnace and foundry grades. Furnace coke is quoted at $3.85, Connellsville ovens, for prompt delivery, and while premium foundry coke still commands $5.35 the standard grade holds at $4.60, ovens.

Shipments of foundry coke are holding up well compared with June at Chicago. This situation is not readily traceable to any single factor but is believed attributable to the unexpected lift given foundry operations by activity in the automo-

tive industry. Prices hold steady with by-product foundry coke $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

Shipments of by-product foundry coke are holding fairly well at a level only slightly below the June volume at Chicago. Prices are unchanged. Production is being curtailed at Birmingham, Ala., but some ovens are continued in service for production of by-products rather than coke.

Nonferrous Metals

Nonferrous Metal Prices, Page 54, 55

New York—Activity in nonferrous metals continued restricted. Lead was active early in the week but later demand fell off with consumers displaying little interest in offerings.

Copper—Light business was done in copper. On Thursday the volume of business was described as the best in some time being above the average for any one day recently. Prices held at 9.00c, delivered Connecticut, and the tone of the market was firm.

Lead—Early in the week lead prices advanced sharply on a spurt in buying. An advance of $2 per ton brought the market to 3.75c, East St. Louis, and 3.85c, New York. However, on Friday with buying slow the American Smelting & Refining Co. cut its published price $2 to 3.75c, New York, and a spread of 3.75c to 3.85c, New York, ruled thereafter.

Zinc—Only light business was done in the zinc market this week. However, despite the presence of shaded bids in the market sellers held firmly to quoted prices and the market held all week at 4.30c, East St. Louis.

Tin—Prices fluctuated slightly in the tin market closing higher than at the start. Demand was dormant only light tonnages being moved. The Austrian crisis was a factor in the market about midweek but it actually had little effect on prices.

Antimony—Some small lot business was done in antimony and for the most part the market was firm. Late in the week the market eased slightly to 8.12½c, duty paid, for spot.

Aluminum—Trading was slow in the aluminum market with prices unchanged.

Fluorspar

Fluorspar Prices, Page 54

Cleveland—Domestic washed gravel fluorspar prices have been reduced $1 to $1.50 a ton to $15.50 to $16, f.o.b. Illinois and Kentucky, for all-rail shipment, and $1 a ton to $17.50 for barge delivery.

Iron Ore

Iron Ore Prices, Page 54

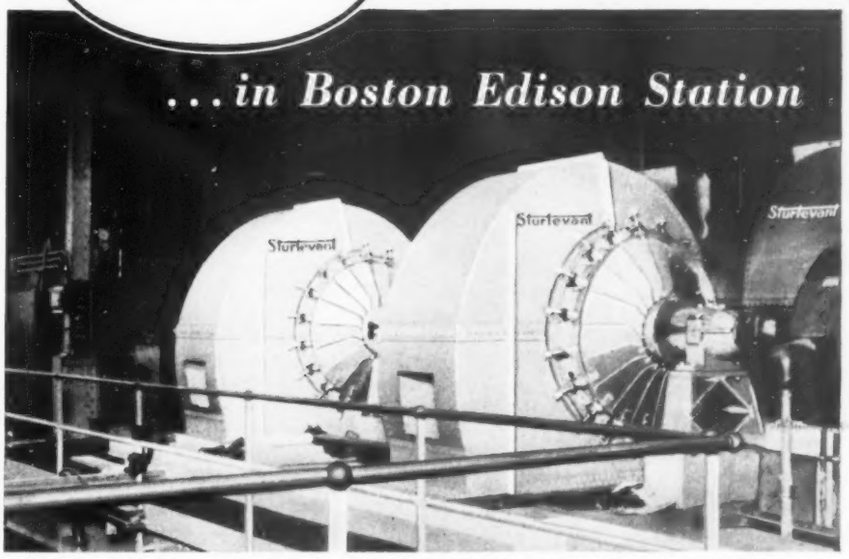
Cleveland—While complete returns on iron ore shipments from the Lake Superior district for July were lacking last week, according to calculations by the Lake Superior Iron Ore association the total will be approximately 4,300,000 tons. This is 165,000 tons less than the movement in June. Consumption has been slowing up.

Ferroalloys

Ferroalloy Prices, Page 54

The movement of ferromanganese

24 Sturtevant DRAFT FANS



Charles Leavitt Edgar Station, Weymouth, Mass. The Edison Electric Illuminating Company of Boston. Designed and built by Stone and Webster Engineering Corporation under supervision of Mr. I. E. Moultrop, Chief Engineer and Superintendent of Construction Bureau. Sturtevant Vane Control Fans shown are used on Boiler No. 7 which is stoker fired and develops 1400 lbs. pressure. Maximum steam evaporated by this boiler per hour is 250,000 lbs.

Used for pioneer installation of high pressure boilers

Every boiler in this station—from No. 1 to No. 8 inclusive—is equipped with Sturtevant Forced and Induced Draft Fans.

The first five boilers installed were equipped with Sturtevant Fans driven by variable speed motors. Boiler No. 6 was equipped with the first Sturtevant Vane Control Fans ever built. These fans, direct-connected to constant speed motors, proved so satisfactory that similar fans were later installed on Boilers No. 7 and No. 8.

The vane control feature of these fans was developed by Sturtevant in 1927. It so convincingly demonstrated its advantages that Sturtevant Fans incorporating this feature are now found in principal power stations throughout the country.

B. F. STURTEVANT COMPANY
Main Offices: Hyde Park, Boston, Mass., Chicago, Ill., 400 North Michigan Avenue, San Francisco, Cal., 681 Market Street
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DRAFT FANS · TURBINES · GEARS · ECONOMIZERS · AIR HEATERS

continues sluggish, due to restricted production of steel. The market is $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is steady at $26, furnace, on lots up to 50 tons, and $24 on 50 tons and over.

Coke By-Products

Coke By-Product Prices, Page 53

New York—Distillate prices are

For

Heat Treating Plants . . . Steel Plants . . . Foundries, Etc.

where hot spots must be cooled and kept cool. The Coppus Aeropane Heat Killer delivers an abundance of cool air at moderate velocity. Light weight . . . portable . . . long life. Send for bulletin 160-3.

COPPUS ENGINEERING CORPORATION

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HEAT KILLERS

firm. With output still light, little spot material is available. Specifications against contracts are fair. Phenol is unchanged in demand and price. Sales of sulphate of ammonia are light, buyers for fall consumption awaiting a price announcement which was expected earlier this month.

Pacific Coast

Pacific Coast Prices, Page 53, 54, 56

San Francisco—(*By Air Mail*)—Despite the fact business in the San Francisco and Oakland districts was at a standstill during the first four days of the past week due to the general strike situation, demand for steel products on the Pacific coast continued unabated.

Reinforcing bar awards aggregated over 5700 tons, the fourth largest weekly total of the year. The award of 5500 tons for the Boulder dam, Boulder City, Nev., was divided between the Judson Mfg. Co., Oakland, Calif., and Sheffield Steel Corp., Kansas City, Mo. W. C. Hauck Co. took 150 tons for a court house at Visalia, Calif. Bids on 750 tons, and also on 850 tons of shapes, for a wharf and transit shed at Stockton, Calif., were returned unopened due to the strike situation and new bids will be called later. Bids have been opened, under proposal 23,207, for 300 tons for the Boulder dam, Boulder City, Nev. Bids have been opened on 1025 tons of plates for the Parker dam in Nevada. Pending plate business exceeds 7000 tons.

Structural shape awards for the week totaled 525 tons. McClintic-Marshall Corp. took 405 tons for bridges for the Southern Pacific Co. at Gaviota and Lento, Calif. Minneapolis-Moline Power Implement Co., Minneapolis, secured 120 tons for a school at Inglewood, Calif. Bids have been opened on 1025 tons for the Parker dam in Nevada.

Bids on 428 tons of cast iron pipe for Fallon, Nev., were rejected and new bids will be taken. Bids have been opened on 500 tons for a high-pressure line in San Francisco requiring 8 to 16-inch pipe. Gilroy, Calif., will open tenders on July 30 for 594 tons of 16-inch, class 150 pipe. San Clemente, Calif., will take bids shortly on 404 tons.

Large Contracts Are Let

Seattle—Opening of bids for important projects features the Pacific Northwest markets. The largest was for two 60,000-horsepower hydraulic turbines and governing equipment for the Bonneville dam. S. Morgan Smith Co., York, Pa., submitted the low figure of $1,193,075 to the United States engineer at Portland, Oreg.

Tacoma opened tenders for 18,800 feet of 52 to 62-inch water pipe for the Green river extension and decided to divide the main contract, subject to PWA approval. Birchfield Boiler Co., Tacoma, Wash., was recommended for fabricating and installing 9000 feet of steel pipe, about 1000 tons, at $102,028. American Concrete Pipe Co., Tacoma, Wash., at $107,062 was recommended for 9800 feet of concrete mains. For miscellaneous accessories Pacific Water Works Supply Co., Seattle, and Hunt & Mottet, Tacoma, Wash., had their low bids approved.

David H. Ryan, San Diego, Calif., finally obtained the contract at $235,570 for building 30 miles of railroad to the Coulee dam site and laying 34½ miles of rails. The low bidder was eliminated because of an irregularity. For the Coulee project the general contractors are in the market for $6,000,000 of equipment to be on the ground within three months. Facilities will be furnished to house 1500 men.

Steel in Europe

Foreign Steel Prices, Page 56

London—(*Via Radio*)—Although most of the British iron and steel markets are seasonally quiet, they are fairly active in the Midlands. Export business is expanding, especially in shipments to Russia and South Africa. Manufacturers of tin plate expect better business when the international agreement in that product materializes. Prices are firm.

The Continent reports some export sales. South America and the Far East are the most active buyers.

Men of Industry

(*Concluded from Page* 21)

sents the third generation of his family to occupy presidency of the company.

Louis E. Murphy, formerly president, has been elected chairman of the board, a new office.

Other officers elected include: Vice president and director of sales, George W. Pressell; secretary, A. E. Carpenter III; treasurer, Dr. R. H. Patch; assistant secretary, C. P.

Stocke; and assistant treasurer, Miss M. M. Menningen.

□ □ □

Russell N. Hanson has been elected president of the American Gas Machine Co., Albert Lea, Minn., succeeding his father, the late H. C. Hanson.

□ □ □

W. A. Watson, for ten years associated with the General Refractories Co., Philadelphia, lately as district manager of this company's Detroit office, is now associated with the Stowe-Fuller Refractories Co., Cleveland, as vice president.

□ □ □

Joseph S. Ruble, formerly associated with the Austin Co. and H. K. Ferguson Co., Cleveland building companies, has been appointed supervisory manager for the federal slum-clearance and rehousing project in Cleveland.

□ □ □

James J. Dale has been elected vice president in charge of sales for the Allsteel Press Co., Chicago. Prior to July 1 he was vice president in charge of sales in the Chicago and Detroit territories for the Henry & Wright Mfg. Co., Hartford, Conn.

□ □ □

William H. Hundt, for 24 years connected with the New York office of Luria Bros. & Co. Inc., iron and steel scrap dealer, has been appointed New York district manager for the organization, succeeding the late Mark L. Tyroler.

□ □ □

H. E. Markland has been named assistant domestic sales manager for the Kelvinator Sales Corp., Detroit. At one time he was vice president and sales manager for the Detroit Flag & Mfg. Co., manufacturer of metal stampings and screw machine products.

□ □ □

Herbert W. Tinker, for several years chief engineer of the Federal Pressed Steel Co., Milwaukee, has been appointed general manager of the Warner Electric Brake Mfg. Co., Beloit, Wis., which is enlarging its line of trailer braking systems to include passenger car and motor truck equipment of this character.

□ □ □

L. J. Horowitz has resigned as chairman of the board of the Thompson-Starrett Co. Inc., New York, but remains as a director of the company. His former position has been abolished.

Joseph A. Flynn and Arthur G. Moulton have been elected directors of the company.

□ □ □

Moxie S. George is now associated with the Inland Steel Co., Chicago, as salesman in the company's Milwaukee office. From 1915 to 1931 he was employed in various operating departments of the American Rolling Mill Co., Middletown, O., in 1924 being sent to the Chicago office. From 1931 to 1934 he was associated with the Moise Steel Co., Milwaukee.

□ □ □

Paul H. Leussler, sales manager of the Omaha Steel Works, Omaha, Nebr., has been elected a member of the steel casting code authority, succeeding the late E. H. Cornelius.

□ □ □

J. H. Lansing has been appointed general manager of the Grand Rapids Malleable Works of the Chicago Railway Equipment Co., Grand Rapids, Mich. Since 1920 he has been active with a number of companies in the malleable iron field and for a time was field assistant to the consulting engineer of the Malleable Iron Research institute. He is chairman of the malleable division of the American Foundrymen's association.

□ □ □

F. J. C. Dresser has been appointed an associate director (advisory) of the PWA housing division, in Chicago to aid in development of the $125,000,000 national low-cost housing and slum clearance program. Former president of the Builders Association of Cleveland, at one time he served in the engineering department of the Chicago and North Western railroad, later joining the Austin Co., Cleveland. He joined PWA as a consultant on federal buildings, later becoming special assistant to the administrator.

Died:

(*Concluded from Page* 18)

Island, N. Y., July 17. At one time he was vice president and a director of a railroad contracting firm in Panama, Canal Zone.

□ □ □

H. C. Halliday, manager of the Chapman Bearing & Engineering Co., Buffalo, at his home in that city, July 20.

□ □ □

Charles W. Hill, 59, for the past nine years patent engineer for the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., at a hospital in that city, July 17.

□ □ □

Frederick, Olin, 73, president of the Olin Gas Engine Works, Buffalo, since its founding in 1893, at his home in Buffalo, July 17, after a short illness.

□ □ □

Thomas Leslie Wilson, 41, a partner in Bauer, Wilson & Co., pig iron agents, Chicago, at his home in Momence, Ill., July 26. He was formerly associated with Illinois Steel Co., Hickman, Williams & Co., and Walter Wallingford Co.

□ □ □

Mrs. James Johnston, mother of A. J. Johnston, president of Hickman, Williams & Co., Cincinnati, at her home in Oconto, Wis., July 25.

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BUFFALO, N. Y.

Branch Offices: New York, Philadelphia, Pittsburgh, Cleveland, Detroit, Chicago.

Here and There In Industry

ALLIS-CHALMERS MFG. CO., Milwaukee, has moved its office at Chicago to the new Field building, 135 South LaSalle street. B. F. Bilsland is manager. This is a return to the original location for the Allis-Chalmers office, as it was in the old Home Insurance building on the same site that the general offices of the company were located at the time of its organization in 1901.

□ □ □

Chain Belt Co., Milwaukee, has appointed Jenison Machinery Co., Twentieth and Tennessee streets, San Francisco, its distributor for Rex construction equipment for northern California. Stocks of mixers and pumps will be carried to assure prompt delivery. E. S. Jenison is president.

□ □ □

John H. Bawden & Co. foundry, Freehold, N. J., one of the oldest foundries in the state, has been sold to E. W. Schumacher, Hillsboro, O., and Michael J. Kelly, Newark, N. J. Schumacher, Kelly Inc., has been incorporated to operate the foundry, which will be reconditioned for production of gray iron, semi-steel, steel, brass and aluminum castings. E. W. Schumacher is president and Michael J. Kelly vice president and superintendent.

□ □ □

R-S Products Corp., Germantown avenue at Wayne Junction, Philadelphia, has completed purchase of the assets, including patent rights and goodwill, of Ryan, Scully & Co. This is the result of a contract made more than a year ago to take over the organization and control of the latter. Facilities have been increased by purchase of the present office and plant property containing over 20,000 square feet of floor space, installation of complete machine shop facilities for more than 90 per cent of its products and consolidation into one plant. The engineering department is in charge of J. A. Ehlinger, who succeeds G. F. Beach, deceased, after being his assistant for many years. An expanded program of sales of standard products as well as special furnace equipment, is under way.

Captions with Observatory Dome Article Misplaced

In the issue of July 23, pages 41 and 42, STEEL described the arc welded steel dome for the new McDonald observatory of the University of Texas, designed by the Warner & Swasey Co., Cleveland, and fabricated by the Paterson-Leitch Co., Cleveland. Inadvertently, captions accompanying three of the illustrations were misplaced.

The caption appearing under the cut at the bottom of page 41 should have accompanied the cut at the top of page 42; the caption with the cut at the top of page 42 should have accompanied the cut at the bottom of the same page; and the caption with the cut at the bottom of page 42 should have accompanied the cut at the bottom of page 41. STEEL regrets this error.

The dome, now being assembled for shipment to its permanent installation on the peak of Mt. Locke, Texas, was welded by the shielded arc process with electrodes and generators supplied by the Lincoln Electric Co., Cleveland.

Equipment

New York—Sales of sheet metal working machinery continue to feature the demand for shop equipment in this district, including shears, brakes and forming tools. One shop in this district has placed equipment for the fabrication of cylindrical telephone booths to be manufactured almost entirely of steel. Demand for most standard tools is dull. A shipment of milling machines for Japan was exported last week against an older order to a mid-west builder.

Cleveland—Mill equipment market was given a favorable impetus last week with announcement that Carnegie Steel Co. will proceed shortly with erection of its 42-inch wide strip mill, capable of rolling strip and sheet up to 36 inches wide and to 18-gage thickness, at the company's McDonald plant, Youngstown, O. Alterations at the Ohio works of Carnegie are contemplated to permit rolling slabs for the new strip-sheet mill. Youngstown Sheet & Tube Co. has started experimental operation of the new electric weld pipe mill at its Campbell plant, according to Youngstown reports.

Chicago—Current inquiry of an industrial plant for equipment to cost approximately $40,000 is outstanding in an otherwise inactive market. The inquiry includes milling machines and lathes. Bids are in on the large inquiry for tools for the new Lane Technical high school. Awards probably will be made to several builders due to the large size of the inquiry and to the fact that delivery is sought before the school year begins. A few miscellaneous orders are noted but little or no business is coming from the railroads. Demand for small tools still is slow.

Construction and Enterprise

New York

ALBANY, N. Y.—Electra Protection Co. Inc. has been formed by H. L. Hutchins, 200 Lancaster street, Albany N. Y., to manufacture lightning protective devices.

BROOKLYN, N. Y.—Navy Metal-Ware Corp. has been incorporated with $10,000 capital to deal in metals and manufactures, by Horwitz & Bragin, 2010 Mermaid avenue, Brooklyn, N. Y.

BUFFALO—Fairbanks, Morse & Co., Chicago, has leased 5000 square feet of space at 1017 Jefferson avenue and will establish a branch warehouse and office.

LOCKPORT, N. Y.—City council has had plans drawn for an incinerator plant with conveyor and elevating equipment, to cost about $60,000.

LONG ISLAND CITY, N. Y.—Korfund Co., 48-15 Thirty-second place, Long Island City, will rebuild its plant, recently damaged by fire, at cost of about $28,000. Company manufactures cork products.

NEW YORK—American Consolidated Tin Mines Corp., W. M. Bennett, vice president and director, 120 Liberty street, will receive bids soon for construction of a tin plant in Lincoln county, N. C., estimated to cost about $300,000.

NEW YORK—Bushwick-Cole Die Mfg. Inc. has been incorporated with 20 shares preferred stock and 100 shares common to manufacture castings and dies, by Schnecker & Schnecker, 225 Broadway, New York.

NEW YORK—Apex Staples Corp. has been incorporated with $20,000 capital to deal in steel products, by Sidney Solomons, 7312 Seventeenth street, Brooklyn, N. Y. Louis Weisen, 1133 Broadway, New York, is attorney.

SCHUYLERVILLE, N. Y. — Fort Miller Pulp & Paper Co. plans to repair its mill and install new equipment at cost of about $30,000.

SOUTHAMPTON, N. Y.—Squires-Johnson Inc. has been incorporated with $11,000 capital to manufacture gas engines and electric motors, by Harry Micah Howell, Southampton, N. Y.

Pennsylvania

PULASKI, PA.—I. O. Hommel & Co., 211 Fourth avenue, Pittsburgh, is having plans made for a 1-story plant, 140 x 150 feet, to manufacture metallic paints, here, to cost about $28,500.

PITTSBURGH—Edward L. Wiegand Co., 7500 Thomas boulevard, will build an addition to its plant. General contract has been awarded to Edward Crump Jr., 4031 Bigelow boulevard, Pittsburgh.

New Jersey

FREEHOLD, N. J.—Schumacher, Kelly Inc., E. W. Schumacher president, has been formed to take over the foundry of John H. Bawden & Co., Freehold, N. J., for production of steel, semi-steel, gray iron, brass and aluminum castings. The foundry

WEIRTON

PRODUCERS OF: Pig Iron—Open Hearth Steel; Billets—Slabs—Sheet Bars—Skelp; Angles, Beams and Channels; Round, Square and Flat Bars; Rails—Steel Plates—Tie Plates—Track Spikes—Splice Bars—Reinforcing Bars; Coke Tin Plate; Kanners Special Cokes—Best Cokes—Charcoals; Lacquered Tinplate; Tin Mill Black Plate (All Finishes); Lacquered Black Plate; Copper Bearing Terne Plate; Hot and Cold Rolled Strip Steel and Strip Steel Sheets; High Finish Sheets; Long Terne Sheets (Common and Special Finishes); Galvanized Black and Blue Annealed Sheets; Corrugated Sheets, V Crimp Sheets, Roll Roofing; Single Pickled, Full Finished and Auto Body Sheets; Coke—Tar — Benzol — Toluol — Ammonium Sulphate.

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Straight Seam or V Seam

For Production or For Repairs—
Adapter Sleeves for Punch and Die Shanks—
Roller Bearing Sleeves

GIFFORD ENGINE CO.
Lansing, Mich.

will be reconditioned and equipment added.

NEWARK, N. J.—Kraft Machine & Tool Co. has been formed by David E. Feldman, 11 Commerce street, to operate a machine shop and tool production plant.

Ohio

CLEVELAND—Winton Engine Co., 2160 West 105th street, is building a 1-story addition costing about $20,000. A recent addition to its testing department has been completed.

CLEVELAND—Roto-Cut Machines Corp. has been incorporated with $10,000 capital and 1000 shares no par value to manufacture cutting devices, by Carl F. Schuler, 950 Union Trust building, Cleveland.

CLEVELAND—Fisher Body Co., Lincoln R. Scafe general manager, East 140th street, will build an addition to house 12 heavy presses for fabrication of automobile bodies for Chevrolet and Pontiac automobiles. Cost is estimated at about $100,000.

ST. BERNARD, O.—Globe Chemical Co. is having plans prepared by H. Ballinger, architect and engineer, 3059 Felts avenue, Cincinnati, for a plant to cost about $90,000.

Michigan

ANN ARBOR, MICH.—Board of public works is considering plans for a sewage treatment plant, pumping station and sewer system, to cost about $379,000.

CHARLEVOIX, MICH.—City clerk is taking bids on construction materials for a sewage disposal plant for which PWA funds are available.

DETROIT—Norman Krecke, architect, 1346 Broadway, is preparing plans for a power plant for the Detroit Creamery Co., on Tillman avenue, Detroit.

DETROIT—Levitt-Ulmer Corp. has been incorporated with $5000 capital to manufacture castings and tools, by Edward H. Levitt, 2510 David Scott building, Detroit.

DETROIT—No-Sag Spring Co., 605 Boyer building, has been incorporated with $5000 capital to manufacture springs and other metal products, by Henry Hopkes, 3440 Seminole avenue, Detroit.

DETROIT—Wolverine Nut Co., 1335 East Milwaukee avenue, has been incorporated with 10,000 shares no par value to manufacture nuts and bolts, by David B. Ireland, 7601 Dexter boulevard, Detroit.

DETROIT—Detroit Multiple Cooker Co. Inc., 2201 St. Aubin street, has been incorporated with $25,000 capital to manufacture multiple cookers, by DeElla B. Mayberry, 2201 Aubin street, Detroit.

DETROIT—Superior Welding & Brazing Co., 6564 Russell street, is receiving bids for a 1-story welding and brazing plant addition, to cost about $30,000. Pollmar, Ropes & Lundy, 2539 Woodward avenue, Detroit, are architects. (Noted July 9).

MENOMINEE, MICH.—City has been allotted PWA loan and grant of $803,000 for a municipal electric light and power plant. August B. Sigel is city clerk.

Indiana

CROWN POINT, IND.—Bids will be received by the city until Aug. 4 for construction of a water purification and softening plant, deep wells and pumps, 300,000-gallon elevated steel tank, to cost about $98,000. C. Brossman, Chamber of Commerce building, Indianapolis, is engineer.

Illinois

BENLD, ILL.—City will take bids soon on a waterworks system for which a PWA loan and grant of $127,000 has been approved.

CHARLESTON, ILL.—Bids will be taken soon by the city on a waterworks filtration plant for which PWA loan and grant of $100,000 has been approved. C. DeLeuw Co., 111 West Washington street, Chicago, is engineer.

CHICAGO—Ackles-Hornkohl Co., 6112 North Mozart street, has been formed by Virgil E. Ackles and associates to manufacture machinery.

CHICAGO—Mercury Mfg. Co., 4118 South Halsted street, is having plans drawn by A. Epstein, 2001 West Pershing road, for a machine shop to cost over $28,000.

CHICAGO—Joseph Weidenhoff, 4352 West Roosevelt road, manufacturer of electrical equipment, will build a 1 and 2-story addition, to cost about $40,000. Frank Huddleston, 140 South Dearborn street, is engineer.

CHICAGO—McLean Welded Products Corp., 530 West Seventy-ninth street, has been incorporated with 200 shares capital stock to do welding as engineers and contractors. Becker & Becker, 105 West Madison street, are engineers.

Alabama

BIRMINGHAM, ALA. — American Casting Co., suffered damage by fire in its plant recently.

FAIRHOPE, ALA.—Town, M. F. Northrop, mayor, plans waterworks improvements. Date for receiving bids not yet set. J. B. Converse & Co. Inc., State Office building, Mobile, Ala., are engineers.

MOBILE, ALA.—Mark Lyons and D. R. Dunlap, 25 Fernway, Mobile, Ala., are negotiating with the Masonite Corp., 111 West Washington street, Chicago, for removal of its plant from Laurel, Miss., to Mobile, for the manufacture of insulating board and similar products.

Delaware

REHOBOTH BEACH, DEL.—An election will be held soon on $160,000 in bonds for a complete waterworks system. F. Ross is mayor.

District of Columbia

WASHINTON—J. Winsor Ives, assistant trade commissioner, Rio de Janeiro, Brazil, writes to the bureau of foreign and domestic commerce, department of commerce, Washington, that it is reported an impbrtant British manufacturer of sheet steel and filing equipment will shortly erect a factory in Brazil for production of steel filing cabinets.

Florida

PANAMA CITY, Fla.—City commissioners have applied for a PWA loan of $91,000 to erect a plant for processing raw cotton and for a density cotton compress. Application for a loan of $430,000 for building a dock and terminal facilities is being considered.

Kentucky

TOMKINSVILLE, KY. — City plans construction of a waterworks system, including dam and pumping station. James C. Carter Jr. is mayor.

Maryland

DUNDALK, MD.—Big Four Distilleries, subsidiary of United Distilleries of Canada Ltd., H. H. Klein, president, Vancouver, B. C., is having plans prepared for a distillery here, to cost about $500,000.

Mississippi

EUROPA, MISS.—Southern States Sugar Refining Co., W. R. Perkins, Starkville, Miss., president, plans to erect a plant seven miles east of Europa, Miss., to manufacture sugar from artichokes. Equipment and plant are estimated to cost $75,000 to $100,000.

PASS CHRISTIAN, MISS.—Dunbar-Dukate Co., R. B. Abbey manager, is improving its plant and will replace present shrimp cannery by 40 x 175 foot building and install new equipment.

South Carolina

GREENWOOD, S. C.—PWA has released $2,767,000 allotment to Greenwood county for construction of a municipal power plant on Saluda river.

Virginia

HAMPTON, VA.—National advisory committee for aeronautics, Langley Field, Hampton, Va., will open bids Aug. 3 for construction of wind tunnel and 2-story shop and office building, with sea wall of steel sheet piling; wind tunnel to be powered with 8000-horsepower electric motor driving 18-blade, 16-foot diameter propeller. Plans can be obtained from chief clerk and property officer, Langley Field.

Missouri

KANSAS CITY, MO.—Central Bridge & Construction Co. has been incorporated by Henry J. Massman Jr., 810 West Sixty-ninth street.

LATTONSBURGH, MO.—City plans electric light and power plant and PWA loan and grant of $70,000 has been approved. E. T. Archer & Co., 609 New England building, Kansas City, Mo., are engineers.

MOBERLY, MO.—City has postponed until Sept. 11 election on $566,000 bonds for altering and erecting addition to municipal electric light and power plant and installing turbo-generators. PWA loan and grant of $700,000 has been approved.

ST. LOUIS—St. Louis Mfg. & Distributing Co. has been incorporated with $60,000 capital to manufacture patented products of metal and other materials, by Clyde J. Vollman and Henry Ploch.

Oklahoma

FAIRVIEW, OKLA.—City has plans

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for repairing its burned light and power plant.

Texas

BURNETT, TEX.—City, C. W. Galloway mayor, has PWA loan and grant of $46,000 for installation of waterworks system, including pumping plant, elevated tank, well and distribution lines. J. W. Beretta Inc., National Bank of Commerce building, San Antonio, Tex., is engineer.

FORT WORTH, TEX.—Drillers Supply Co. has been incorporated with $10,000 capital by E. K. Okey and J. M. Loffland, 700 Fifth avenue, Fort Worth, Tex.

GLADEWATER, TEX.—Pelican Refinery Co. is having surveys made for rebuilding its gasoline refinery at cost of about $150,000.

POTH, TEX.—A loan of $30,000 has been approved by PWA for waterworks improvements, including pumps, well, mains and hydrants. A. A. Ririe, 655 East Woodlawn avenue, San Antonio, Tex., is engineer.

SMITHS BLUFF, TEX.—Pure Oil Co., 36 East Wacker drive, Chicago, will lay an 8-inch pipeline, 26 miles long from the new Bosco field to its refinery here. Capacity of the line will be 30,000 barrels daily.

WACO, TEX. — Waco Spring & Bumper Co. has been incorporated by Thomas P. Scott and Joseph Pinto.

WESLACO, TEX.—Harry Ratliff secretary and manager, will receive bids Aug. 14 for sewage disposal plant.

Wisconsin

DURAND, WIS.—City, A. C. Smith, clerk, plans additional waterworks pumping equipment and mains. O. G. Holway, Durand, Wis., is engineer.

FREDERIC, WIS.—City, M. Peake clerk, plans waterworks improvements, including pumps and mains, to cost about $17,000. A. Westenberg, Frederic, Wis., is engineer.

MAYVILLE, WIS.—B. B. Shoe Co., which recently purchased the building formerly occupied by the Harsh & Chapline Shoe Co., has completed additions and will install machinery and equipment. The company is changing its name to Mayville Shoe Corp.

MILWAUKEE—Froedtert Grain & Malting Co. has started an addition 170 x 240 feet, to cost $600,000, with equipment, and to add 1,000,000 bushels per year to its capacity.

RACINE, WIS.—Young Radiator Co. has been given the contract for furnishing air conditioning units and blowers for 50 new streamlined passenger cars being built by the Chicago, Milwaukee, St. Paul & Pacific railroad at its West Milwaukee, Wis., shops.

Minnesota

FARIBAULT, MINN.—Acrobat Shoes Inc. has been incorporated with capital of $150,000 as successor to the Shaft-Pierce Shoe Co. and will install additional machinery and equipment. About 400 pairs per day will be produced. C. D. McGrew is president.

MINNEAPOLIS—Northwest Research Foundation will build a factory for making tests to determine the practicability of converting aspen or poplar trees into alpha cellulose. The plant will have capacity of 500 pounds of cellulose per day.

MINNEAPOLIS—Fleischmann Malting Co., 1717 Second street Northeast, will build an addition to its elevator at Delaware and Erie streets Southeast, to cost $50,000. Elevating, sorting and conveying machinery will be installed. The company is also building additions to its grain elevator and malting plant at Red Wing, Minn.

ROCHESTER, MINN.—Public utility board, A. J. Lentfer secretary, will take bids soon for an addition to the municipal electric light and power plant, to cost $100,000. Schuett-Meier Co., 1967 University avenue, St. Paul, is structural engineer.

SHAKOPEE, MINN.—D. B. Davis and W. C. Bean will remodel the old Nyssen brewery into a distillery and will incorporate a company under the name of Northwest Distilleries Inc. New machinery and equipment will be installed.

ST. CLOUD, MINN.—City has been alloted loan and grant of $1,229,000 by PWA, for a municipal electric light and power plant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

ST. PAUL—City plans reconstruction of the waterworks system, including a 1500-kilowatt turbo-generator and pumping unit in the McCarron pumping station, for which a $133,000 PWA loan and grant has been allowed; 500,000-gallon elevated steel tank, for which a PWA loan and grant of $31,000 has been allowed. G. M. Shepard is city engineer.

WABASHA, MINN.—J. G. Dill Co. will rebuild its elevator and seed plant, which was burned last spring with a loss of about $150,000.

Iowa

DUBUQUE, IOWA—Old Town Beverage Co. Inc., Harold F. Smith secretary, treasurer and general manager, has leased a 3-story building at Main and First streets for a liquor rectifying and compounding plant and will install new machinery and equipment.

DUBUQUE, IOWA—Julien Dubuque Brewing Co., Anthony F. Heeb president and general manager, recently incorporated with capital stock of $500,000, has started rehabilitation of its brewery at Thirtieth and Jackson streets. Considerable new machinery and equipment will be installed. The brewery is to have annual capacity of 325,000 barrels.

MASON CITY, IOWA—Northwestern Distributing Co. is building a warehouse and feed manufacturing plant 90 x 100 feet and will install elevating machinery, conveyors, a truck dump and feed manufacturing machinery.

Kansas

INDEPENDENCE, KANS. — City plans waterworks improvements, including oil engines, generators, centrifugal pumps and accessories, to cost about $60,000. G. Hackmaster is city engineer. A PWA loan and grant has been approved.

OSAWATOMIE, KANS.—City plans construction of a waterworks and electric light plant on PWA loan and grant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

PARSONS, KANS.—City will hold election in August to vote on bonds for construction of a municipal gas plant estimated to cost about $275,000.

Montana

COOKE CITY, MONT.—Vance Consolidated Mines & Power Co., headed by Major William G. Vance, Morristown, N. J., and Fred F. Holliday, Billings, Mont., has taken over the Western Mines & Power Co. property and will spend about $1,000,000 in reconditioning the mill and smelter.

GLASGOW, MONT.—Captain Theo. Wyman Jr., engineer corps., 707 Postal Telegraph building, Kansas City, Mo., will receive bids until Aug. 2 for two sets of machinery and parts for derrick boats for the Fort Peck, Mont., dam and reservoir project.

MISSOULA, MONT.—Gust D. Forssen, Missoula, Mont., is low bidder at $32,000 for construction of shops and garage for the state highway department.

Pacific Coast

SEWARD, ALASKA—A federal loan of $118,000 has been authorized for construction of a steam and diesel electric generating station and steam heating distribution system here.

BELLEFLOWER, CALIF.—American Oil Refinery Co., J. W. Snowden in charge, is building an oil refinery at Cerritos and Washington boulevards, to cost $7000.

STOCKTON, CALIF. — California Packing Corp., Stockton, Calif., is building a canning plant to cost about $200,000.

TORRANCE, CALIF. — Hughes-Mitchell Process Co. Inc., Majestic building, Denver., L. M. Hughes chairman, has bought an 18-acre site on Normandie avenue near 190th street and plans to build a chemical plant to treat lead-zinc ores, to cost about $1,000,000. Capacity about 30,000 tons of ore per year.

WATSONVILLE, CALIF. — Slater Shelving System Inc. has been formed here to manufacture shelving, brackets, standards and showcase fixtures.

SALEM, OREG.—William Einzig, state purchasing agent, will open bids Aug. 1 for ten 30-ton auto truck scales for the state highway department.

ABERDEEN, WASH.—Grays Harbor Pulp & Paper Co. plans to construct a 50-ton digester annex to increase productive capacity from 100 to 150 tons per day. Cost is estimated at $100,000.

Dominion of Canada

BURLINGTON, ONT.—City will start construction soon of a waterworks plant to cost about $150,000 on a site east of the city. H. G. Acres, Niagara Falls, Ont., is consulting engineer. George H. Power is city engineer.

TORONTO, ONT.—City will take bids soon for a pumping station near Victoria Park, to cost $900,000, as part of the $14,000,000 duplicate waterworks system. H. G. Acres, Niagara Falls, Ont., is consulting engineer.

MONTREAL, QUE.—City Gas & Electric Corp. Ltd. is having plans prepared for a gas manufacturing plant.